

Save the Wild U.P.

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Save the Wild U.P. Written Comments to DEQ

Aquila Resources Back Forty Mining Permit Application and EIA
Project ID: 14A021

Submitted February 16, 2016

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Interest in Application

Save the Wild U.P. (SWUP) is a grassroots environmental nonprofit dedicated to protecting the wild lands and freshwater resources of Michigan's Upper Peninsula. Through public awareness and education, SWUP strives to protect the Upper Peninsula from unsustainable development, environmental degradation, and dangerous contamination. The Upper Peninsula is witnessing a resurgence in mining and mineral exploration which threatens multiple watersheds in the Lake Michigan and Lake Superior basins. This resurgence also threatens the treaty protected natural and cultural resources of federally-recognized tribal nations and highlights the state's responsibility in maintaining government-to-government negotiations when these resources are threatened. Playing off the area's history of economic boom-and-bust cycles, mining companies move in promising good jobs and a watchful eye to the environment — but mining and milling bring short-term profits at the expense of legacy environmental contamination. The Aquila Resources Back Forty mining application currently under review perfectly illustrates the environmental hazards of mining.

Statement of Concern

Save the Wild U.P. is raising numerous concerns about the proposed open-pit sulfide mine on the banks of the Menominee River, including: concerns about the underlying land swap between Aquila and the State of Michigan; threats to tribal archaeological resources; threats to treaty-protected natural resources and Menominee River fisheries; threatened and endangered species; impacts on groundwater, surface water and wetlands; threats to the riparian corridor; misleading or fraudulent statements made in the application regarding the "life of mine" and methods of mining proposed; concerns about public accessibility of permit documents, responsiveness, and regulatory capture.

Land Swap Concerns and Objections

- The entire planned Back Forty *open pit mine* and Tailings Waste Rock Management Facility *basins* (TWRMF) hinge on a single underlying assumption: **that the State of Michigan will agree to a proposed LAND SWAP with Aquila Resources.** Perhaps two thirds of the open pit mine's footprint falls on Escanaba State Forest land, along with most of the Oxide TWRMF footprint. Both the Open Pit and the Oxide TWRMF would be permanent landscape features. At both sites, waste rock and tailings produced by the mine would be *permanently interred*.
- According to a recent conversation with DNR's Steve Sutton, he was aware of the proposed Aquila land swap, but said that it is "not a done deal" and that they (DNR) have been "working on this for years."
- This key proposal of a **Land Swap** is only mentioned once in the EIA (Volume II, in a paragraph discussing the need for cultural resource assessment of State-owned parcels targeted for a land swap), and again in the text of a map key, buried in the application (MPA Volume I, page 77). **There appears to be no mechanism for public input into the proposed land transaction.**
- When will the **Land Swap** be evaluated? Which office is evaluating the proposal, and when will full details (including land valuations, parcel descriptions, biological assessments etc) related to the proposed **Land Swap** be made accessible to the public? When and to whom should public comments on the Land Swap be addressed? Save the Wild U.P. requested this information from Joe Maki and Steve Casey in an email on January 7th, and has yet to receive a response.¹

¹ Correspondence available.

State-owned Shakey Lakes savanna land is found adjacent to the proposed mine site. The Escanaba State Forest 2012 harvest plan also mentions the presence of rare oak savanna habitat, and includes the northern edge of the range of butternut (*Juglans cinerea*), a native tree which is being decimated throughout its range by a non-native fungus that causes butternut canker.³

Critical Habitat: Vernal Ponds

Numerous vernal ponds and forested wetlands are located on these state-owned lands. These ponds are used by a diverse wildlife, and are irreplaceable for some frogs and salamanders, who return to the same pools they hatched from in order to breed.⁴ Both the DNR and the MDEQ emphasize the importance of these rare ecosystems on their websites; both departments outline the need to protect these ecosystems, going so far as to highlight state and federal laws that are in place to protect these distinct environs.⁵⁶

Wetlands and Vernal Pools

The State of Michigan and the MNFI have emphasized the need for increased vernal wetlands protections, and numerous vernal wetlands are identified in Aquila's EIA materials. MNFI states "Vernal pools are small, isolated wetlands that occur in forested settings throughout Michigan. Vernal pools experience cyclic periods of water inundation" (...) Though relatively small, and sometimes overlooked, **vernal pools provide critical habitat for many plants and animals, including rare species and species with specialized adaptations for coping with temporary and variable hydroperiods.**"

Aquila's mining facility diagrams appear designed to "work around" wetlands, and are clearly constrained by hydrological features of the site. But Aquila's plans, which will necessitate large-scale tree harvest, land clearing, stockpiling of the topsoil and overburden, road building and ditching, will destroy vernal pools regardless of whether the pools themselves are bulldozed or spared. Vernal pools "are considered to be an integral component of a variety of upland and lowland forested natural communities throughout Michigan" as they "are completely or partially surrounded by forests, woodlands, or savannas (Colburn 2004). This sets them apart from pools in open landscapes that typically harbor species assemblages of emergent marsh, wet prairie, wet meadow, and so forth."

Vernal pool features cannot simply be "worked around." The planned de-forestation of Aquila's site would effectively destroy the vernal pools. "All pools receive an annual deposition of tree leaves, and leaf detritus plays an important role in maintaining the biota of vernal pools."⁷

³ Boraks, A. and K.D. Broders. 2014. Butternut (*Juglans cinerea*) health, hybridization, and recruitment in the northeastern United States. *Canadian Journal of Forest Research* 44 (10): 1244-1252.

<http://www.nrcresearchpress.com/doi/abs/10.1139/cjfr-2014-0166#.VsDPs-Z2FyU> (2016 Feb 14).

⁴ Michigan Dept. of Natural Resources (MDNR). April 19, 2013. Wicked big puddles! Learn more about vernal pools. http://www.michigan.gov/dnr/0,4570,7-153-10370_12141-300728--,00.html (2016 Feb 14).

⁵ Michigan Department of Environmental Quality: Michigan's Rare Wetlands.

http://www.michigan.gov/deq/0,4561,7-135-3313_3687-100355--,00.html

⁶ MDNR. Wetlands. http://www.michigan.gov/dnr/0,4570,7-153-10370_22664-61132--,00.html

⁷ http://mnfi.anr.msu.edu/abstracts/ecology/vernal_pool.pdf p. 6

For all practical purposes, destroyed vernal pools are impossible to mitigate. “The character of any given vernal pool is the result of a complex response to and interplay between climate, weather, hydrologic processes, water and soil chemistry, pool geometry, fire patterns, vegetation, fauna, and the surrounding environment. Because all these factors tend to vary across the landscape, **each vernal pool is unique.**” Diverse rare plants, amphibians, reptiles, birds and mammals are known to be associated with vernal pools in Michigan, and “vernal pools contribute significantly to biodiversity in Michigan by providing critical habitat and food chain support for many animal species (...) and represent the juxtaposition of aquatic and terrestrial environments.”⁸

Given their importance and function, how many of the wetlands on this site are categorized as vernal pools? Are they “regulated” or nonregulated? Vernal pools have been identified as critical habitat, especially in terms of their interconnection with riparian corridors, but as they occur within forests - they are transitional, entirely integral to forested lands.

Aquila’s facility design fails to incorporate any of MNFI’s recommendations for conservation and management of vernal pools, including the following: “2) Avoid or minimize activities that disturb soils or tree canopies in and near vernal pools, particularly during critical time periods for most amphibians. This is important because equipment use and canopy alteration can impact water quality and quantity and shift vegetation, resulting in changes to microhabitat that can pose serious problems for many amphibians 3) **Maintain a buffer of native forest vegetation around vernal pools to protect them from land use activities and alterations to water quality, with concentric forest harvest buffer zones are 30 m (100 ft) with very limited or no harvest and 120 m (400 ft) with limited harvest and protection practices for the forest floor and woody debris** (Calhoun and deMaynadier 2008, Michigan DNR and Michigan DEQ 2009). **Recommended buffers between roads and vernal pools are at least 100 m (330 ft) wide. Other buffer zones of up to 300 m (1,000 ft) in which land development can be held below certain densities have been recommended** (Calhoun and deMaynadier 2008). 4) Maintain as much natural cover, wetland area, and drainage connection as possible between groups of vernal pools and between vernal pools and other wetlands, so that animals may continue to disperse between scattered vernal pools and wetlands.”⁹

Critical Habitat: Special Conservation Areas, Ecological Reference Areas

State-owned lands along the Menominee River riparian corridor are considered “Special Conservation Areas” and are intended to be managed as habitat for wildlife species. According to the Escanaba State Forest management plan for this compartment¹⁰, adjacent lands are designated as “Ecological Reference Areas (ERAs) – high quality examples of natural communities that have been identified as Element Occurrences (EOs) by the Michigan Natural Features Inventory (MNFI)¹¹ within the context of their natural community classification system. Ecological Reference Areas are chosen for their ecological integrity, long-term viability, and their rarity on the landscape.” Given the proximity of ERA lands, we believe that the State-owned parcels currently proposed for the land swap with Aquila are of exceptionally high ecological value, and should remain in State ownership, and be managed for restoration and maintenance of natural ecological processes and values.

⁸ Ibid, p. 11

⁹ Ibid p.25

¹⁰ Escanaba Forest Management Unit, Compartment Review, #23 Entry Year: 2012, <http://bit.ly/Esc-23>.

¹¹ Michigan Natural Features Inventory. 2016. Website. <http://mnfi.anr.msu.edu/> (2016 Feb 15)

The Environmental Impact Assessment (file *Environmental Impact Assessment Volume II_EIA.pdf) contains numerous inaccuracies. For example, the statement is made that the site contains “inundated shrub swamp”: “*The vegetation in the wetlands in the Project Area is variable and includes rich conifer swamp, northern hardwood swamp, emergent marsh, northern shrub thicket and inundated shrub swamp, ephemeral wetlands, and poor conifer swamp.*” (EIA Volume II, p. 29).

The names of these community types are the ones used by the Michigan Natural Features Inventory (MNFI). As defined by the MNFI, Inundated shrub swamp is only found in southern half of the Lower Peninsula and is dominated by buttonbush (*Cephalanthus occidentalis*)¹², a shrub which only occurs in Michigan in the Lower Peninsula¹³.

Under the heading “Research Natural Areas”, page 35 of the EIA includes the statement: *There are no Research Natural Areas in the U.P. as defined in Code of Federal Regulations CFR Title 36, Section 251.23.*”

This is false. There are 5 *established* Research Natural Areas in the U.P.: Dukes, Grand Island, and Horseshoe Bay in the Hiawatha National Forest, and McCormick and Sturgeon River Gorge in the Ottawa National Forest.¹⁴ There are also 10 *candidate* Research Natural Areas in the UP, a fact ignored by the EIA. All are in the Hiawatha National Forest: Little Waiska Basin, Nahma, Pointe aux Chenes, Rock River Canyon, Scott's Marsh, Shingleton Bog, St. Martin Peninsula (Point), Upper 18 Mile Lake, and Weden's Bay.¹⁵ Aquila's proposed mine site is less than 68 miles from Dukes Research Natural Area.¹⁶ There are also dozens of established RNA sites in Northern Wisconsin. Waupee Lake Swamp Research Natural Area, and Battle Creek Research Natural Area,¹⁷ the nearest RNA sites in Northern Wisconsin, are located only 30 and 31 miles from Aquila's proposed mine site, respectively.

Rare Plant Surveys “Superficial and Inadequate”

The rare plant survey described (starting on page 3474 of EIA Volume IIG) for “potential habitat for plant species listed as rare by the Michigan Department of Environmental Quality (MDEQ)” (actually it's the Michigan DNR that lists these) seems very superficial and inadequate. According to the permit application Aquila consultant Stantec Consulting Services Inc. completed a habitat assessment and rare plant survey on August 28, 2015 within a 19 acre extension (their “Study Area”) of the Back Forty Mine Project in Menominee County, Michigan (“Project Area”) (Figure 1).

The consultant's supposed finding that sheep fescue (*Festuca trachyphylla*) was a dominant on their 19-acre 2015 “study area” sounds highly unlikely. According to the Michigan Flora Online¹⁸ sheep

¹² Michigan Natural Features Inventory. 2016. Michigan's Natural Communities. Inundated Shrub Swamp. <http://mnfi.anr.msu.edu/communities/community.cfm?id=10680> (2016 Feb 15).

¹³ Reznicek, A. A., E. G. Voss, & B. S. Walters. February 2011. *Cephalanthus occidentalis* L. Michigan Flora Online. University of Michigan. <http://michiganflora.net/species.aspx?id=2578> (2016 Feb 15)

¹⁴ United States Forest Service, Northern Research Station. 2016 Jan 25. Established Research Natural Areas. <http://www.nrs.fs.fed.us/rna/established/> (2016 Feb 15).

¹⁵ United States Forest Service, Northern Research Station. 2016 Jan 25. Candidate Research Natural Areas. <http://www.nrs.fs.fed.us/rna/candidate/#MI> (2016 Feb 15).

¹⁶ <http://www.nrs.fs.fed.us/rna/mi/hiawatha/dukes/>

¹⁷ <http://www.nrs.fs.fed.us/rna/wi/nicolet/battle-creek/>

¹⁸ Reznicek, A. A., E. G. Voss, & B. S. Walters. February 2011. Michigan Flora Online. University of Michigan. <http://michiganflora.net/home.aspx> (2016 Feb 14).

fescue is a non-native species of “roadsides, fields, and disturbed places” that is only sparsely introduced in the UP and not known to occur in Menominee County. Their dryland *Festuca* is most likely the native *F. saximontana*.

The consultants were only able to find one sedge (*Carex pensylvanica*) in the entire 19-acre study area. A number of other woodland sedges are undoubtedly found in both the habitats they claim to have surveyed. These may include *Carex pedunculata*, *C. communis*, *C. intumescens*, and a number of others in the mixed hardwoods, and *C. tonsa*, *C. peckii*, *C. argyrantha* and others in sandy forest. And any rare sedges that may occur on the site such as assiniboia sedge (*Carex assiniboinensis*), a state-threatened sedge known from moist forest along rivers, including in Menominee County, or tinged sedge (*C. tinctoria*), known in Michigan only from dry, sandy open ground in neighboring Dickinson County, were undoubtedly missed.

The consultant's assertion that they could not distinguish the state-endangered dwarf milkweed (*Asclepias ovalifolia*) from poke milkweed (*A. exaltata*) and common milkweed (*A. syriaca*) on the site because the milkweeds were done flowering by late August is a rather shocking admission that their survey was inadequate. The consultants themselves state in their report that a) dwarf milkweed is known from the proposed mine site, and b) a July survey would have been far more effective in identifying dwarf milkweed. Why didn't they do a survey in July then?

Even if the milkweeds on the site didn't have flowers or ripe seed pods, they should have been able to identify it with reasonable certainty. The Michigan Flora online includes the following under dwarf milkweed: “As in so many milkweeds, the leaves are rather variable in shape, but the slender stature and cream flowers make this rare and delicate prairie species easy to recognize. Besides a terminal umbel, there are usually one or two additional umbels in the upper leaf axils. Coarse leafy plants with pale flowers keying here are probably forms of the common milkweed, *A. syriaca*.”

The chances that the proposed mine site supports dwarf milkweed as well as Pitcher's thistle (*Cirsium pitcheri*, listed as “special concern” in Michigan) are relatively high, yet the consultants by their own admission may well have missed them.

Archaeological & Cultural Concerns

Construction of this mine will damage disturb or destroy the high-quality archaeological sites present on both private lands (acquired by Aquila Resources) and State of Michigan public lands (Escanaba State Forest). What role will the State's Historic Preservation Office have in guiding the mine permit decisions made by MDEQ's Office of Oil, Gas and Minerals? The State Archaeologist will be 1 voice among 10 on the mine permit review team. On behalf of environmentalists, concerned citizens, tribal leaders and scholars, we ask the Michigan State Archaeologist to strongly oppose the proposed Land Swap and the Aquila Back Forty mine application.

The State of Michigan's interest in permitting this mining project is overshadowed by state and federal trust responsibilities to the Menominee Nation and any other tribes who may claim cultural heritage or treaty-protected natural resources in this section of the Menominee River.

Land Swap Threatens Precontact Archaeological Sites

- State Lands targeted for the **Land Swap** include priceless precontact archaeological features, as documented in extensive materials filed with Michigan's State Historic Preservation Office.¹⁹ Aquila's proposed Land Swap cannot be made on the basis of "reconnaissance level" archaeological survey included in the application's Environmental Impact Assessment (EIA). Tribal and independent archaeologists have expressed significant disagreements with conclusions reached in Aquila's EIA.
- The Back Forty mine pit and related facility construction is poised to destroy a section containing mapped archaeological sites, which must be understood to be part of a larger swath: two miles of raised garden beds, ancient features that are now widely considered the only pristine raised agricultural beds remaining in Michigan. "The extent of the ridging is impressive. Fortunately, most of the site appears undisturbed."²⁰ This agricultural area includes related village sites and potential burial mounds. The Menominee County Historical Society previously sought to stop mineral exploration in this area, due to risks posed to these cultural sites.
- The land targeted to become Aquila's open pit mine is part of a longer swath of archaeological, historical, and cultural sites, including mapped, surveyed, unexplored and intact sites, extensive garden beds, village sites and both excavated and unexcavated mounds.
- The proposed Land Swap includes State land that is part of a rich and largely intact archaeological zone. Cultural resources are certain to be destroyed if the proposed Land Swap is approved by the MDNR, a clear violation of State and Federal trust responsibilities to Federally-recognized tribes. The proposed land swap would ensure the destruction of ancient sites of critical archaeological and indigenous cultural importance. As the Menominee Nation pointed out in the MDEQ's Public Meeting (January 5, Stephenson MI), "valuable and irreplaceable sites, artifacts and human remains" stand to be destroyed. **If MDNR staff approve the proposed land swap, the State of Michigan will knowingly violate their trust responsibilities.**

Statements on Pre-European Contact Archaeological Sites

The Menominee Nation is deeply concerned about the protection and preservation of the archaeological cultural resources in and adjacent to the proposed Back Forty mine site. Their website states:

"There were Menominee settlements both at the river's mouth and at locations upstream including 60 Islands, White Rapids and Chalk Hill. Situated on the Wisconsin side of the Menominee River at 60 Islands is a well known 17th-19th century Menominee settlement that includes two dance rings thought to be associated with the Dream Dance, a Midewi lodge cemetery and a sturgeon weir. The late Louis Bernard Kakatosh, a life-long Menominee resident of the region and great grandson of the prestigious Menominee chief Tomah, told of the many locations along the Menominee River from its mouth to Sturgeon Falls where the Menominee buried their dead. The archaeological sites situated in

¹⁹ Primary archaeological research was conducted at this site on the Menominee River by Dr. Marla Buckmaster, professor emeritus of Northern Michigan University, from the 1970s through 2000. See Buckmaster, Marla. 1973. Archaeological Survey of the Menominee River Watershed. Also see Brose, David. 1968. The Backlund Mound group. Wisconsin Archeologist 49 p. 34-51. <https://archive.org/stream/wisconsinarcheol49wiscrich> (2016 Feb 14).

²⁰ Buckmaster, Marla, "The Northern Limits of Ridge Field Agriculture: An Example from Menominee County." An Upper Great Lakes Archaeological Odyssey. Wayne State University Press, 2004.

the 60 Islands area, also known as the Backlund Mounds and Village/White Rapids site complex, are ancestral Menominee sites. This includes a long stretch of several miles along the Menominee River to White Rapids, north to Chalk Hill and beyond. The landscape is peppered with the remnants of raised agricultural fields that define the northern limits of corn agriculture in prehistoric times. Mound groups, some excavated, others still intact on both State of Michigan and private lands at 60 Islands within the Back Forty Mine project footprint. Many of these sites appear to be areas of possible impact from the Back Forty Mine development and the Menominee Indian Tribe of Wisconsin is concerned about their protection and preservation.”²¹

According to the comments made by Menominee Tribal Leader Gary Besaw at the MDEQ public meeting on January 5th, “The Tribe is concerned with the site evaluation and predictive models concerning the cultural properties. The technical reports of the CCRG and 106 Groups are only reconnaissance level surveys that provide a basic overview. We are concerned with the level of testing, if any, of the predictive models. Furthermore, it is clear that evaluations have not been conducted on many sites. For those sites that have, we do not agree with recommendations on which sites are eligible for the National Register of Historic Places. For example, there is existing evidence from work done by Bill Mognahan to indicate multiple building stages & episodes of the gardens. According to the technical reports, Me 61, the two miles of raised fields, are the only pristine raised fields left in Michigan.”

Besaw continues, “To date, Section 106 of the National Historic Preservation Act has not been deemed to be applicable to the Project; however, the Tribe has serious concerns about the potential impacts to historically and culturally significant sites, artifacts or remains located at or near the project site. While responsibility for issuing federal surface water discharge permits and wetlands permits has been delegated to the state, the federal trust responsibility owed to the tribes has not. Because the state permitting process does not afford the Tribes the same protections that would be available to them under Section 106, the Tribe seeks assurances from Michigan DEQ, Office of the State Archeologist, and Michigan State Historic Preservation Officer that the valuable and irreplaceable sites, artifacts and human remains at issue will not be destroyed. Furthermore, we are asking for clarification from Michigan DEQ on what standards will guide their decisions relating to tribal trust issues, considering our Tribe’s traditional cultural properties. Additionally, we are seeking clarification on what standards will protect and preserve identified and suspected burial sites. **Moreover, we are asking that no ground be broken until these sites have been completely evaluated for listing qualification under the National Register of Historic Places.**”²²

Save the Wild U.P. agrees with the Menominee Nation’s assertion that no construction or ground-disturbing work take place in this area until a more complete cultural heritage assessment takes place under the National Historic Preservation Act.

Former Wisconsin DNR archaeologist Dr. Victoria Dirst also reviewed archaeological sites along the Menominee River corridor, stating “As a result of heavy forest cover, it is difficult to assess the nature and distribution of additional archaeological sites, although **it is possible that the area could contain**

²¹ <http://www.menominee-nsn.gov/GovernmentPages/Initiatives/Back40Mine/SixtyIslands.aspx>

²² <http://bit.ly/Besaw-DEQ-Jan5>

hundreds. Because the area is relatively undeveloped, it is thought that most of the remains would be well preserved generally no more than 10 inches below the surface.”²³

Dr. Marla Buckmaster, who has conducted extensive field research in this area since the 1970s, opposes any disturbance in the sensitive archaeological zone (roughly 1,500 feet wide) bordering the Menominee River and continuing both north and south along the river. “Since few garden bed sites have been excavated or even tested, and little is known regarding their age and cultural affiliation, site 20ME61 provides an opportunity to add to this relatively small body of data on ridged field agriculture in the Upper Midwest. The site extends in discontinuous clusters of ridges and furrows punctuated by mounds of varying sizes, slightly less than **two miles along the banks of the Menominee River. These raised beds extend inland or south from the riverbank as much as 500m, or 1,500 feet.**”²⁴ Buckmaster’s conviction is that there are undocumented burial sites within this zone, with a strong potential for human remains.

Aquila’s EIA erroneously concluded that the archaeological zone was only 150 ft wide.

This rich archaeological zone is best delineated by Buckmaster’s work at the 20ME61 site, which she describes for the MDEQ as follows:

“The archaeological site 20ME61 is located on the banks of the Menominee River in an area known as Sixty Islands. **The site is significant in the prehistory of the Upper Great Lakes for several reasons.** First, although historic records indicate prehistoric raised garden beds were once found throughout lower Michigan, none of these survived agricultural, industrial and residential development. At present **20ME61 is the only remaining site of these once numerous raised beds in Michigan.** Secondly, its location in the Upper Peninsula of Michigan makes it the most northern of the reported prehistoric garden sites in the entire Midwest. Test excavations at 20ME61 in the 1990’s suggested native peoples attempted to alter the microenvironment immediately adjacent to some of the raised beds by placing a paving of river rock in the furrows. This clearly needs additional investigation and suggests these early farmers had significant knowledge of the environment. The recovery of several corn cupules in the test excavations is a clear indication that corn was grown in these beds although the area lies well outside the area with 140 frost free days, the number of days considered necessary for growing prehistoric corn. In addition a C-14 date of A.D. 1435 was obtained on one of the corn cupules. The corn cupule was a rare opportunity to date these prehistoric features. While exploring the area surrounding the raised beds, the archaeological field crew noticed numerous mounds which appeared to be individual burial mounds on a ridge overlooking the other side of River Road. Out of respect for Native American beliefs these were noted but not investigated. It should be mentioned, however that two large burial mounds can be found in the area of the raised beds. Both of these mounds have been potted (plundered) at some time in the past. Finally, the presence of both shell and grit tempered ceramics along with a C-14 date of A.D. 1435 and the presence of two burial mounds and the Backlund site make this area an excellent location for future investigation of the relationship between Woodland and Oneota cultures, an area of research that is poorly understood.

²³ Dirst, Victoria: CULTURAL RESOURCES ALONG THE MENOMINEE RIVER, October 1998, <http://dnr.wi.gov/files/PDF/pubs/ea/EA0131.pdf>

²⁴ Buckmaster, Marla, “The Northern Limits of Ridge Field Agriculture: An Example from Menominee County.” An Upper Great Lakes Archaeological Odyssey. Wayne State University Press, 2004.

Because of all of these characteristics and its potential for future research, 20ME61 must be preserved. **The loss of any of this unique archaeological data would significantly limit our ability to understand this prehistoric period at some future date.**²⁵

Buckmaster considers the archaeological site to be of regional and national importance, especially in light of unique feature of the garden beds, and the site's northern location: "Of particular note when discussing temperature control is a rock feature located in one of the 1 x3-m units excavated during the summer of 1999. The feature consisted of rock used to line and partially fill the furrow. This rock lining was clearly visible in both the floor of the unit and the wall profile (Figure 3.5). Since rock was rarely encountered in these loamy, water-laid soils during the excavation, this may have been a purposeful attempt at thermal manipulation with heat accumulating and being stored in the rock during the day, then released at night when the air temperature dropped."

"Site 20ME61 is noteworthy in Michigan prehistory since it is located more than three hundred miles north of any other prehistoric garden site in the state."²⁶

Life of Mine – Applicant Provided Misleading Information

See attached analysis, *"Will Michigan DEQ Reject Fraudulent Mine Permit?"*²⁷ (PDF)

Hydrology Elevation Questions

In Hydrology > Wetlands > Figure 3., showing floodplains and depth of the Menominee River, the "100 year flood stage" is noted to be 212 meters above mean sea level (mamsl). The "floodplain limit" is noted to be 221 mamsl, and "Aquila property" is noted as being 225 mamsl. The figures in this section are poorly referenced and defined, in terms of their relative distances from river, or reference to surface coordinates. How is a 100 year flood stage (212 mamsl) found lower than the floodplain limit (221 mamsl)? In figure 6, what is the wetland ID code for the "wetland" located at "220 mamsl," or below the floodplain elevation? Isn't this wetland also owned by Aquila? What is the 200 year flood limit for this section of the river?

According to EIA Volume II, p. 135, Foth mapped a "revised 100 year floodplain" based on the estimated flood elevation of 212 meters above mean sea level, using "topographic interpretation of FEMA firm panel 5502590475B." FIRM information is known to be inaccurate for this area of the Menominee River. The revised 100 year floodplain boundary is even closer to the pit wall, and overlaps with the Project Boundary. Foth should remap based on the 200 year floodplain, using updated FEMA guidance.

It is unclear what the "225 mamsl Aquila property" elevation refers to. Referenced elevation points need to correspond with GPS points for clarity. Looking at a pit shell diagram from Aquila's 2009 SRK Financial Report, for example, the overburden profile for the north wall of the open pit is identified as

²⁵ Statement provided to Save the Wild U.P. by Dr. Marla Buckmaster, February 2016.

²⁶ Buckmaster, Marla, "The Northern Limits of Ridge Field Agriculture: An Example from Menominee County." An Upper Great Lakes Archaeological Odyssey. Wayne State University Press, 2004.

²⁷ <http://bit.ly/DEQ-reject-fraud>

being well below 225 mamsl – perhaps only 223 mamsl?²⁸ While some figures include the cut-off wall boundary, None of these elevation schematics show the intended depth of the cut-off wall, where it is planned to be tied into “bedrock.” Most concerning, none of these elevations include elevations for the pit shell, which will reach much lower elevations than anything described in this hydrology section, causing groundwater drawdowns and wetland loss.

Open Pit Mine Concerns

The permit application contains inconsistent data or outright errors regarding the distance between the “Open Pit Mine” and the Menominee River: in some diagrams, the cut-off wall is noted as being “18m (59 ft)” from the 100 year flood line (Application, Volume I.pdf, Figure 5-1). The table of contents of Volume I.pdf (page v) refers to “Appendix D” which appears in file Volume ID.pdf. Page 4 of Appendix D states: “The cut-off wall will have a setback distance of 30.5 m (100 feet) from the river ordinary high water mark, which is the 100-year, 24-hour flood level, i.e., 211.7 m. In the EIA, the distance between the open pit and the river is described as being “50 meters” (164 ft) from the Menominee River, which would place the cut-off wall more than 18 m from the river.

These conflicting distances seem to indicate that the design of this very important part of the mine is not very precise. This is unacceptable, particularly when the features in question (the cut-off wall and mine pit) are so close to the Menominee River.

Menominee River - Sturgeon Concerns²⁹

Lake Sturgeon are the region's "largest, longest-lived fish" (...) "slow-growing, late maturing fish, with females spawning for the first time when they are 20 to 25 years old and then only every three to five years thereafter." Sturgeon fry imprint on the *specific water chemistry of their natal rivers*, enabling their lifelong return migrations. In Wisconsin, the statewide total harvest of lake sturgeon in 2008 was only 39 fish. The Menominee River sturgeon recovery is only possible due to "protective regulations, dedicated funding, and robust research helping restore lake sturgeon to more of their native range" in waters such as the Menominee River.³⁰

Given trust responsibilities and treaties between the United States government and Native American tribes, MDEQ needs tribal input and consent regarding the specific threats of this sulfide mine to Menominee River sturgeon fisheries and restoration efforts. Threats to lake sturgeon and other fisheries include degradations to the Menominee River watershed from the mine's wastewater discharges, catastrophic or flood-related accidental discharges, likelihood of post-closure groundwater contamination (acid mine drainage) in the backfilled pit, significant short-term and long-term wetland, riparian and groundwater drawdowns, seismic threats to spawning habitat, and air pollution dispersal models that predict the deposition of airborne heavy metals and other contaminants of concern over a broad swath of adjacent surface water and riparian habitats.

²⁸ Figure 20: Section 35200 East (rotated grid) Block Model with Resource Zinc Grades, from “SRK Consulting 3CA023.001 – Resource Estimation Technical Report, Back Forty Deposit” <http://bit.ly/SRK-2009-Aquila>

²⁹ <http://www.fws.gov/midwest/greenbay/hydropower/pdf/MenomineeRiverFishPassageEA.pdf>

³⁰ <http://dnr.wi.gov/news/weekly/?id=183>

According to Denny Caneff, the Executive Director of River Alliance of Wisconsin: "We're involved in a lake sturgeon habitat project downstream from the proposed mine, at Menominee/Marinette. If there's an accident at that mine, it would set back years of habitat restoration and deeply damage what will end up being an \$8 million investment."

The U.S. Fish and Wildlife Service show at least nine fish habitat and GLRI restoration projects on the Menominee River (2010-2016) totalling over \$5,200,000.³¹

The very real potential for the degradation or destruction of the sturgeon population associated with this river brings up additional questions:

- Is this section of the Menominee River covered by Consent Decrees with tribes, in the State of Michigan or Wisconsin?
- Are the Menominee River sturgeon fisheries jointly managed as *interstate resources* by the State of Michigan, the State of Wisconsin, and tribes?
- Is the permitting of a new point-source polluter on the Menominee River consistent with the goals of interstate fisheries and the Great Lakes Restoration Initiative?
- Has the MDEQ sought feedback from all tribes whose natural resources (esp. sturgeon fisheries) will impacted or degraded by this project?
- Does the MDEQ's Mine Permit Review Team include a tribal representative? Save the Wild U.P. and other environmental stakeholders requested information about the members of the Mine Permit Review Team, but it has yet to be provided.
- Does the Wisconsin DNR have a defined regulatory role in reviewing this proposal? Menominee River and its flowages appear to be managed as "Wisconsin-Michigan boundary waters" and the Menominee River has been assigned a Wisconsin HUC watershed code.

Menominee River - Mussel Concerns

Save the Wild U.P. is concerned that NPDES discharges and other water pollution from the Back Forty sulfide mine would cause a permanent loss of aquatic functions due to "temporary impacts" (especially problematic since Aquila's "life of mine" statements are in doubt). Pollution will impact the Menominee River, Shakey River, Shakey Creek and wetlands. Other impacts include the intentional taking or relocation of freshwater mussels during construction of the NPDES outfall, and unintentional takings of freshwater mussels through habitat loss and contamination, especially changes related to sedimentation (construction) and water quality degradations.

Water pollution and water quality are key to freshwater mussel habitat. "Habitat loss has been identified as the most important factor causing the decline of mussel species throughout North America."³² "The largest threat to freshwater fisheries is water quality, and mussels actually help us fight the battle against poor water quality (...) Because of the services or benefits to the ecosystem that these species provide, they are critical to the sustained health of a body of water. When these species begin to decrease in number, it can indicate that there is a problem with the health of a water body, and therefore, they are routinely referred to as "indicator" species."³³ "Freshwater mussels are important components of aquatic ecosystems and are increasingly being regarded as the aquatic

³¹ <http://greatlakesrestoration.us/projects/fws.html>

³² <http://www.dnr.state.mn.us/mussels/threats.html>

³³ http://www.bassresource.com/fish_biology/endangered-fish-species.html

"canaries in the coal mine". They provide food for fish, birds, and mammals, and are considered to be biological indicators of a river's health."³⁴

What are the threats to mussels in all stages of their life cycle from heavy metals? The application does not address these anticipated impacts. Heavy metals and other mine-effluent pollutants that will be released into the environment by Aquila's Back Forty facilities pose an imminent and substantial threat to health and habitat of state-listed native mussels. While adult mussels may be moved to make way for the NPDES outfall pipe, *as proposed* ("The plan for relocating species will be described in the SAP, to be prepared as a condition of the permit" per MPA Volume ID), larval-stage mussels (glochidia) are dispersed throughout the water column, and are **utterly reliant** on fish species such as largemouth bass, with which they have a complex symbiotic relationship. Mussels are site-adapted and cannot survive without the host fish. Is the MDEQ proposing to relocate the symbiotic fish species (largemouth bass or others) along with the native mussels? Unfortunately, host species have not been identified for many native mussels, including some of these ETSC mussels. "Mussels are long-lived animals meaning they can live for several decades and in some instances a century or more."³⁵ Aquila's mussel survey failed to mention "glochidia" or discuss reproductive success of native mussels in this watershed.

The EIA (p. 39) lists three species of mussels found in the Menominee River that are listed as rare and endangered by the Michigan DNR. According to MNFI data, the river is host to other rare (state endangered) species of native mussels not mentioned in the EIA, including round hickorynut (*Obovaria subrotunda*, state endangered) which "was historically present in at least seven watersheds in Michigan. Recent records (post 1989) of live individuals have been found in only three watersheds (Black, Clinton, and Menominee). Though populations exist in the less impacted Menominee River watershed, round hickorynut has undergone severe declines in Southeastern Michigan, a former stronghold for the species. **Host species have not been determined for round hickorynut.**"³⁶

"There is limited information about mussels in general, and in the UP there's even less known about them," said DNR fisheries biologist Jessica Mistak of Marquette. "If we can determine their habitat preferences, perhaps we can protect some of that habitat to allow those mussels to prosper, especially the rare species."³⁷

The EIA also neglects to mention that two of these species, the black sandshell (*Ligumia recta*) and the round pigtoe (*Pleurobema sintoxia*) are also listed as special concern/protected wild animal (SC/P) in Wisconsin.³⁸ **As mining activities will affect Wisconsin waters, Aquila must comply with Wisconsin law as well.**

³⁴ http://www.dnr.state.mn.us/nhnrp/mussel_survey/index.html

³⁵ <http://www.dnr.state.mn.us/mussels/howlive.html>

³⁶ <http://bit.ly/MNFI-mussels>

³⁷ http://www.lssu.edu/whats_new/articles.php?articleid=1546

³⁸ Bureau of Natural Heritage Conservation, Wisconsin DNR. 2014 June. Wisconsin Natural Heritage working list. <http://dnr.wi.gov/topic/NHI/documents/NHIWorkingList.pdf> (2016 Feb 15).

Unassessed Vulnerability of Mine Site to Extreme Flood Hazards

New research strongly links climate change (particularly increased precipitation during rain events) and shifting flood models. According to a recent article from OnEarth, published by the Natural Resources Defense Council,

“If we assume that the 100-year flood has a certain elevation, when in fact it’s five feet higher, that means the so-called 100-year flood is much more likely to occur than we’ve determined,” says Rob Moore, head of NRDC’s water and climate team. So, why are our flood-risk calculations so off? One reason is that they’re based on historical data that show how a river behaved in the past at a particular spot, but doesn’t factor in current or future environmental changes. “This is an acceptable strategy if and only if flood risk tomorrow can be correctly assumed to be pretty similar to previous years,” says Moore. “Climate change renders that assumption null and void.” In the case of the Midwest, climate change is a growing factor in shifting precipitation patterns. According to the Third National Climate Assessment, the heartland has warmed 1.5 degrees Fahrenheit since the late 1800s, and some areas of it saw up to 20 percent more precipitation during that same period. The upward trend in moisture is expected to continue, too, with the heaviest downpours getting heavier—meaning that when it rains, it will pour, and when it pours, it will likely flood.”³⁹

Aquila’s mine permit application does not include or even define a 200 year flood line. The applicant’s reliance on the 100 year flood line should be considered a deprecated modeling tool, insufficient for siting a sulfide mine on the largest watershed in Upper Michigan. **Based on updated guidance from the Joint Binational Conference report, Save the Wild U.P. recommends the site meet requirements of the more conservative 200 year flood line model, minimum.**⁴⁰

The permit application relies on a decades-outdated flood insurance rate map (FIRM, 1991). FIRM fails to delineate known floodplains on the Michigan side of the river. The river bank of the Menominee River in the proposed mine’s location, according to the Menominee County County-Wide Hazard Mitigation Plan, is generally identified as an **SFHA** zone, or an “area of significant flood hazard.”

One local resident, attending the MDEQ Public Meeting held in Stephenson on January 5th, voiced concerns that this proposed mine site would be vulnerable to *extreme flood scenarios, because of several upstream dams on the Menominee River*, stating that a **flood caused by catastrophic dam failures would FAR exceed calculations for the 100 year flood line**. The person stated that “Menominee County has developed a Hazard Resilience Plan” which includes dam failure zone data, and suggests that, in the event of a dam failure, **catastrophic flood waters could “extend miles inland from the Menominee River”** and “because of this (possible dam failure zone) a Girl Scout Camp upstream of the proposed mine site had to be closed down, due to the risk.”

No information about a “dam failure inundation zone” could be found in Menominee County’s Hazard Resilience Planning document.⁴¹ According to the Federal Emergency Management Agency (FEMA) **“For many dams, the dam failure inundation zone is not known.”**⁴² This is the area that would be flooded if the dam failed and the impoundment behind the dam drained. **“Not having knowledge of**

³⁹ <http://www.onearth.org/earthwire/mississippi-river-flooding-frequency>

⁴⁰ <http://www.onearth.org/earthwire/mississippi-river-flooding-frequency>

⁴¹ Menominee County Hazard Resilience Plan (2012) <http://bit.ly/MenomineeCoPlan>

⁴² Federal Emergency Management Agency’s Risk Mapping, Assessment, and Planning (Risk MAP).

these risk areas could lead to unprotected development in these zones.”⁴³ Also, larger federal dams that do have inundation mapping are frequently restricted to “For Official Use Only” and are not made available to the public due to terrorism concerns. The dams upstream from the Aquila site are privately owned by power utilities.

SWUP made inquiries with Lake Township, who forwarded the question to Menominee County’s Emergency Management Coordinator, Richard Sexton. Sexton responded:

“All hydro dams fall under FERC (Federal Energy Regulatory Commission) for regulating flows. Some can hold water back and others must pass whatever comes in. All dam operators have flood plans, but they don’t generally share them due to concerns for terrorist attacks. Information is generally marked **“contains critical infrastructure information, do not release”**. This person did a study on flooding along the Menominee River and might have some information. Donna Buechler, Executive Director, Menominee Conservation District, 906-753-6921 ex 101. Additionally all inundation mapping usually has a disclaimer that depending on what type of failure and where it occurred could affect the outcome of the flood area. They will most likely have to contact the individual dam operators to see if they will release the information. Years ago they had a general flood plan, now each dam has its own plan.... The county hazardous mitigation plan has one picture of a floodplain if that helps.”⁴⁴

Have dams upriver on the Menominee River been assessed for “potential cascading dam failures?

There are two hydroelectric dams are located immediately upstream⁴⁵ of the proposed Back Forty mine site: White Rapids Dam (2.5 miles upstream of proposed mine site) and Chalk Hills Dam (2.5 river miles upstream of White Rapids Dam), both owned by WE Energies.⁴⁶ According to the Wisconsin DNR report entitled Comprehensive Fisheries Survey of Grand Rapids Flowage, “The hydroelectric company, WE Energies, has operated this dam as run of river since 1997 and provides relatively, stable flows through the flowage. That license won’t expire until 2037. WE Energies also owns the entire shoreline zone, so that habitat should be maintained in a natural state and **no development is anticipated in the coming years.**”⁴⁷ Both of these dams are regulated under the Federal Energy Regulatory Commission.

Obviously, WE Energies’ “no development” phrase is out of date. **The mining permit application needs to include inundation data that only WE Energies or FERC can provide.**

Are either of these proximal upriver dams – the White Rapids Dam and the Chalk Hills Dam – considered “High hazard (C1)” or “Significant hazard (C2)” dams? **Does this section of the Menominee River watershed have the potential for cascading dam failure? FERC maintains this information.** According to 2015 guidance from FEMA, “Dam Inundation Maps” should be prepared for all C1 and C2 dams. These maps should be shared with local Emergency Management Agencies (EMA’s) to develop evacuation plans. **The dam breach inundation maps should also be shared with**

⁴³ Ibid.

⁴⁴ Correspondence from Richard Sexton, Emergency Management Coordinator, Menominee County.

⁴⁵ <https://goo.gl/maps/GrfneBMRKer>

⁴⁶ <https://www.we-energies.com/home/HydPP.pdf>

⁴⁷ <http://dnr.wi.gov/lakes/documents/fishandplantreports/marinettewhiterapidsflowage2005.pdf>

local planners and decision makers for inclusion in land use planning and zoning for the potentially impacted areas.”⁴⁸

Siting is a major concern. **Before a high-risk open pit sulfide mine is considered for the bank of the Menominee River, “dam failure modeling, inundation mapping, and consequence estimating” should be completed**, according to U.S. Army Corps of Engineers guidance.⁴⁹ If “consequence estimating” has been completed, it was not included in the application.

Transportation Route Concerns

Save the Wild U.P. is deeply concerned about the lack of a comprehensive transportation plan, as required by Part 632. The mine’s infrastructure footprint and transportation route must be detailed in the permit. Under Rule 103, “Mining Activity” clearly includes transportation of ore. Rule 203 states: *“The mining, reclamation, and environmental protection plan (...) shall include, at a minimum, (xviii) roads, railroads, docks, piers, and other transportation infrastructure, and provisions to prevent release of contaminants to the environment from ore or waste rock during transportation.”*⁵⁰

- How will the final ore/dore product be shipped?
- How will cyanide be transported to the site (does the shipping present other possible hazards such as spills for communities along the route?)
- How will limestone be shipped to the Back Forty site (for the purpose of neutralizing acid in TWRMF, and in the backfilled pit)? Who is the limestone supplier? how many tons per year? how many trucks?
- According to the Air Quality permit, “hydrated lime” will also be used in the recovery process as a reagent. The lime will arrive via “bulk transport trucks. The silo will be designed to hold up to 50 metric tons of pebble lime. Based on estimated lime usage, the silo will need to be refilled approximately every six to seven days.” That means 50 metric tons of pebble lime per week. How many trucks of limestone products will be imported weekly? What is the capacity of a single truck? What is the source of the hydrated lime product? What is the source of limestone that will be used during processing, in the TWRMF, and ultimately in the open pit (backfill).
- According to maps included in the archaeological report, the cultural survey area extended far to the northeast of the proposed facility. There is a logging trail through the forest heading this direction, connecting near the route of large electrical transmission lines⁵¹ which cross the Menominee River at the White Rapids Dam, and veer southeast. The archaeological review map included a strangely shaped area on this far NE corner which corresponds to the spot where Aquila will no doubt propose to connect to the electrical grid.
- Citizen comments at the MDEQ Public Meeting on January 5th included “12,000 homes worth of electrical power will go into this mine site!” Why is the electrical transmission and related infrastructure construction plan not clearly outlined within this permit?

⁴⁸ FEMA Mitigation Dam Task Force, Strategic White Paper on Dam Risk (2015)
<http://www.fema.gov/media-library-data/1450272827214-fb60879c33e180f3541a5cfb133e54b2/DR-SC-4241-FinalWhitePaper.pdf>

⁴⁹ U.S.A.C.E., Engineering and Design, SAFETY OF DAMS – POLICY AND PROCEDURES (2011)
http://www.fema.gov/media-library-data/20130726-1848-25045-5136/10_hydrosafetydam_app_d.8.pdf

⁵⁰ Ibid, page 20.

⁵¹ Under Part 632, permit must define (q) **Existing and proposed infrastructure and utilities.** (r) **Areas actively maintained for public recreation.** (s) **Natural areas as defined in R 324.35101.**,
https://www.michigan.gov/documents/deq/DEQ-OGS-metallic-mining-Part632_308856_7.pdf page 18.

- What is the proposed haul route for Aquila’s exported product? What is the proposed haul route for imports of limestone, employees etc.?
- A section of the River Road is set to be destroyed (and mined out) “during the mining phase.” Is there an existing agreement with Menominee County or Lake Township to agree to this? No one in the Township office is aware of such an agreement or plan, and details (including rerouting) were not included in the transportation plan. This seems an obvious omission.
- The application calls for “upgrading roads as needed” but fails to outline a specific transportation plan. Potential use of a forest road cutting through State of Michigan lands – over public lands not owned by Aquila – is the most likely candidate for infrastructure corridors and potential haul roads connecting the Back Forty mine site with County Road 356.

Concerns about Flotation and TWRMF

The Tailings and Waste Rock Management Facilities (TWRMF) proposed for the Back Forty Project are troubling. Aquila states that the TWRMF’s are designed to accommodate materials produced during the “life of mine” — a 7 year life of mine. If they actually are working towards a 16 year LOM, the design of the TWRMF’s is inadequate. Additionally, the oxide tailings and waste rock TWRMF is located in a parcel of land belonging to the State is condemning this parcel of state land to what amounts to perpetual care really in the best interest of the public?

Concerns about Proposed Open-Pit

Surficial layers of rock (under glacial and sedimentary overburden) are described as highly weathered and fractured, greatly increasing the risk of infiltration by floodwaters of the Menominee River. Infiltration of floodwaters could lead to structural instability and potential collapse of the cut-off wall and pit. Infiltration of groundwater to or from the pit will threaten contamination of groundwater, surface water of the adjacent Menominee River, result in water quality degradations at the GSI, and/or enable acid mine drainage to occur during the Back Forty mining operations, or post closure. Fractured and heavily weathered bedrock layers will provide hydraulic conveyance between the mine pit and the Menominee.

Geochemistry and Acid Generation Concerns

In order to characterize tailings, Aquila had to analyze the geochemistry of tailings and test whether or not tailings would produce acidic leachate or acid mine drainage. All tests indicate great potential for tailings to produce acidic leachate, with a “majority” and “77%” of samples producing acid.

- “...results of geochemical testing showed that the tailings samples had the potential to produce acidic leachate...containing antimony, arsenic, cadmium, copper, lead, mercury, selenium, silver and zinc...”
- “...waste rock samples had potential to produce acidic leachate...”

- Many heavy metals, uranium, arsenic and other contaminants of concern are "...present at 3x or more times the average crustal abundance..."⁵²

In an attempt to neutralize acidic leachate, Aquila proposes a "limestone amendment plan", but did not include it, stating it "will be prepared after further geochemical testing is complete..."⁵³ According to Al Geddicks, "Adding limestone to the backfilled waste rock to neutralize pH during post closure...as was employed at the Flambeau Mine, did not neutralize reactions within the pit. Reactions- dissolution and precipitation of metals - continue to occur within the pit."⁵⁴ Once again, Aquila's plan to emulate the Flambeau Mine seems a poor choice.

- **What is the ore's iron content and has limestone "armoring" been considered?** Iron will precipitate and form rust, iron hydroxide precipitate, that will coat anything that it comes in contact with -- especially limestone. The effectiveness of the limestone is diminished if it has crust on it. A number of constituents, especially sulfate and nickel and some metalloids like arsenic and antimony are not affected by pH. The pH can be raised by adding limestone and those constituents will not precipitate out of solution.
- **Has the applicant considered the unintended and time-based effects of adding limestone, which will cause some metalloids to precipitate (increasing these contaminants) as pH is neutralized?** Arsenic, selenium and antimony are three metal-like substances; they're called metalloids or oxyanions when they're in solution. When the pH is increased, arsenic, selenium and antimony will be leached out of the solution and the concentration can actually increase. The addition of lime requires a careful balance; for those three constituents, it actually makes things worse.

Cyanidation, Mercury Use and Smelting Concerns

Aquila Back Forty's proposed milling process — cyanidation, mercury retort and smelting — raises the following serious concerns:

- Total acid dissociable cyanide - in the EU levels are 10 ppm for effluent, what are U.S. levels?
- Cyanide will be used for leaching gold and silver from finely ground ore. The "pregnant liquid" is washed out of the slurry and sent to a Merrill-Crowe process where powdered zinc is added to solidify the gold/silver particles; these are sent to a tip-pour furnace for smelting into doré. By contrast, "PolyMet intends to avoid perhaps the most destructive parts of metal mining. There will be no poisonous solvents like cyanide, and no smelter to cook the ore. Smelting can create serious air pollution. Instead, PolyMet will separate metals from ore in an autoclave – a closed process using high heat and pressure. PolyMet officials say the only emission will be steam, which can be scrubbed for traces of acid."⁵⁵
- Why is Aquila proposing the more "dangerous" solution? Is cyanide leaching and furnace refining the best technology for gold and silver recovery, or simply the cheapest option?

⁵² MPA Volume IE

DEQ-OOGM D 2015 22063 2015-11-12 Aquila Resources Mining Permit Application - Volume IE
Contents: Appendix H - Treatment and Containment Plan for Tailings and Waste Rock

⁵³ IBID, p. 8

⁵⁴ Back 40 Mining Permit Application. Draft Comments. February 9th, 2016. Al Geddicks, Wisconsin Resources Protection Council. <https://drive.google.com/file/d/0BwDqaes6rJxSUDN3OUo2ZjJJRjA/view?usp=sharing>

⁵⁵ <http://www.mprnews.org/story/2006/05/15/rangesulfideminig>

- The waste slurry will be subjected to a “cyanide destruction process” before sludge is de-watered and sent to the treated waste storage facility. The cyanidation process is described as a closed system, but how much of the cyanide is lost to air (emissions) or water (tailings) annually?
- Aquila claims they will create a “cyanide waste management plan” according to the voluntary Industrial Waste Cyanide Code. **Why was this code not included in the permit application for full review?**
- Gold cyanidation (vat leaching) was done, with major spills⁵⁶ and damaging environmental releases, at the Ropes milling site (Humboldt Mill). What, if any, special regulations are in force in Michigan concerning safe use of cyanidation?
- How will be the final “Weak Acid Dissociable” (WAD) cyanide levels be established for water and waste?
- Menominee County Board passed a resolution opposing use of cyanide in Menominee County.
- Aquila will be using a furnace to help recover ore. Could they ship unrefined ore? Perhaps not, given Aquila’s extremely high waste-to-precious ratio.
- How much cyanide will remain in the wastewater? Unclear, since NPDES permit is not yet available for public review.
- Aquila proposes to roast the ore and use cyanidation. Following cyanidation of the ore, they will use a “tilt-flow furnace” to recover gold/silver from the precipitate. Mercury retort will also be used in the recovery. Did Aquila evaluate the autoclave process proposed by the PolyMet project? A comparison of technologies, including cost/benefit analysis and a clear outline of the possible environmental hazards, should be included in the mine permit application.
- Aquila’s proposed use of a “tilt-flow furnace” qualifies as smelting.⁵⁷ What are the “thermal pollution” (emission) problems related to this sort of smelting?
- What air and water quality impacts could be avoided if Aquila did not use mercury retort and cyanidation? According to Aquila’s Air Permit application, “This type of configuration is used at numerous gold processing facilities in other parts of the country. Given the high capture efficiency of this type of unit and use by the gold processing industry for this purpose, use of the mercury condenser should be BACT for this type of control.”⁵⁸
- Are there any regulations concerning cyanide or cyanidation under Michigan’s Part 632 rules? Part 632 Nonferrous mining rules include a **placeholder** for new rules — for example, if a permit application for uranium mining is ever received by MDEQ. Does cyanidation in gold mining qualify for the creation of special rules?
- The State of Montana has banned cyanide. Industry appealed the ban, but Montana’s State Supreme Court has upheld the state’s ban on cyanide in mining, which addresses both heap leach and vat methods. Oregon has special regulations regarding bio-available cyanide (which interacts with or is readily absorbed by living organisms). What steps has Michigan taken to ensure that the mining industry’s use of cyanide will not damage environmental resources?
- What were the long-term and short-term environmental impacts of Rope’s cyanidation? Is bio-available cyanide still found in the Humboldt Pit, or in detectable amounts in any of the wetlands used for transporting Humboldt’s wastewater discharges? Cyanide was found at elevated levels during baseline studies at the Humboldt site.

⁵⁶ Correspondence between Gail Griffith, SWUP, and Steve Casey, MDEQ.

⁵⁷ Explanation of the proposed [Merrill-Crowe](#) process

⁵⁸ [Aquila Resources Air Permit Application](#), page 43 of 575.

- The vat leach system proposed states that cyanide is recovered in the system and reused. How much cyanide is lost or depleted? How much cyanide will be burned off in the furnace? How much cyanide will be lost as tailings? If the vat leach is a closed system, why is additional cyanide required annually? How much bio-available cyanide will end up in the oxide waste stream, and ultimately the Menominee River (via NPDES discharges)?
- According to permit application, the slag (furnace waste product) will be shipped off-site. How hazardous is the slag waste, and where will slag ultimately be disposed? The undefined outcome of Back Forty's slag represents a considerable hazard "since slag produced in refining copper, zinc, cadmium and other base metals can contain significant concentrations of a number of potentially toxic elements, including arsenic, lead, cadmium, barium, zinc and copper" (and) "can release these elements into the environment under natural weathering conditions and cause pollution of soils, surface waters and groundwater." Will slag be considered hazardous waste, or a potentially marketable product? Recent research into slag contamination identifies "dissolution of the glassy material in the slag as the major source of potentially toxic metals released to the environment. Ironically, many modern smelters use water jets to quench their slag to form a fine-grained, glassy material that is convenient for disposal or resale. This makes it more likely that the slag will release the toxic elements that it contains to the environment. For that reason, **future decisions concerning the management of this metallurgical waste should be based on scientific knowledge of the mechanisms that control its environmental impact, not ease of disposal or secondary market value.**"⁵⁹

Financial Assurance Concerns

- The financial assurance should not be structured to allow diminution as the project proceeds. Part 632 requires that operator maintain financial assurance during mining operations until the department determines that all reclamation has been completed and for a post-closure monitoring period as described in 63209(6) and (7). Impacts from mining often do not become known for years and any planned releases prior to the full post-closure monitoring period is irresponsible.
- Further, although 25% of the financial assurance is statutorily allowed to be comprised by a statement of financial responsibility, 75% must be comprised by any one or a combination of bond, escrow, cash, CD, irrevocable letter of credit, or other equivalent security tool. Since Aquila is a low-asset corporation and the project's viability is borderline at best, we seek that you require cash or a CD for the 75% portion of financial assurance.
- The applicant has included no information regarding the financial assurances for the this project. The financial assurance is referred to on p. 109 of the Mining Permit Application, under Rule 206 1e, Provisions for Financial Assurance. The applicant's response to this in NOT APPLICABLE. As for the Financial Assurance Update and the Release of Final Financial Assurance, the applicant responds, TO BE DETERMINED.⁶⁰ When will this critical information be available to the public?
- Remediation of open pit mines is notoriously difficult, even under the best of circumstances. In this project, the use of cyanide leaching and the proximity to the Menominee River would only complicate remediation and increase the expenses. In the review of the Eagle Mine

⁵⁹ <https://news.stanford.edu/pr/98/981209slag.html>

⁶⁰ MPA Volume I

DEQ-OOGM D 2015 22054 2015-11-12 Aquila Resources Mining Permit Application - Volume I
Contents: Regulatory Forms and Checklist, including: MDEQ Mining Permit Application and Financial Assurance Form; Organization Report; and MPA Checklist

application, MDEQ hired a consultant to assist with developing a financial estimate for potential natural resource damages; we request that you do likewise for this application.

Reclamation Plans Should **Not** Be Modeled On Flambeau Mine

- Aquila states that the Back Forty pit reclamation will be modeled on the “environmentally successful” model of the “Flambeau Mine.”
- According to Al Geddicks, executive secretary of the Wisconsin Resources Protection Council, “Groundwater at the Flambeau Mine site has **not** been protected from contamination. Monitoring data submitted by Flambeau Mining Company (FMC) itself to the Wisconsin Department of Natural Resources (DNR) shows significant pollution in the groundwater within the backfilled pit and in two Intervention Boundary wells located directly between the backfilled pit and the Flambeau River.”⁶¹
- “In June 2014, the U.S. Environmental Protection Agency listed “Stream C” at the Flambeau Mine site as “impaired waters” due to copper and zinc toxicity linked to the Flambeau mine operation (...) The Flambeau Mine has also severely contaminated groundwater. Monitoring wells at the mine site show the groundwater contains high levels of manganese, zinc, copper and sulfates—in some cases hundreds of times higher than drinking water standards.”⁶²
- The Flambeau Mine, post-closure, had no “compliance wells” within the backfilled pit. Without compliance wells, there is no way to enforce an exceedance violation. This is hardly a good example for Aquila to follow. It will be critical to evaluate the full “boundary” of the mine area, which in one diagram appears to cross/contain the Menominee River, and include part of the Wisconsin riverbank.
- According to EIA, Volume II p. 30, “3.4.5 Mitigation of Groundwater Impacts” there are NO groundwater compliance wells planned for the “
- Lots of concerns about water balance (acidic pit conditions in post closure years) especially with fractured rock and hydraulic interconnectivity to river, proximity of springs on riverbank. River level will be at a lower elevation, post closure, than the backfilled pit.
- In the case of Flambeau Mine, water balance is not returning according to predictions, and Aquila is using the same firm (Foth) to develop their models. In documents related to groundwater pollution at the Flambeau Mine, Al Gedicks stated, “Mr. Donahue suggested in his testimony that a defensible time period for accuracy in computer modeling for groundwater contamination at mine sites is 250 years. Yet, the computer modeling utilized by Mr. Donahue’s firm **(Foth) for the Flambeau Mine project did not accurately predict the levels of groundwater contaminants in the above-cited wells even one year after the pit was backfilled, and the inaccuracies in modeling persist to this day.**”⁶³
- Given the time period required to achieve water chemistry balance in a pit mine back-filled with acid-producing waste-rock, allowed to refill with water, would the Aquila pit or TWRMF (leachate collection) represent a perpetual care facility?
- Groundwater in the pit will be allowed to migrate to the adjacent Menominee River during post-closure, after the pit is backfilled, refilled with water, and ‘capped’ with non-reactive

⁶¹Back 40 Mining Permit Application. Draft Comments. February 9th, 2016. Al Geddicks, Wisconsin Resources Protection Council. <https://drive.google.com/file/d/0BwDqaes6rJxSUDN3OUo2ZjJRJA/view?usp=sharing>

⁶² Letter from Al Gedicks to Milwaukee Journal Sentinel Editor, January 13, 2016.

⁶³ Evidence on the Flambeau Mine for the Wisconsin Senate Select Committee on Mining October 22, 2012 <http://bit.ly/Flambeau-evidence>

overburden and soil. During this post-closure condition, the water chemistry in the pit will be highly acidic, reacting with waste rock to leach toxic metals into the groundwater. Will rebound and post-closure normalization take decades — or hundreds of years? If contaminated groundwater is expressed through springs to the Menominee River, what water treatment will be possible?

- What is Michigan’s statutory definition of “Perpetual Care”?

Wetland Destruction Concerns

Save the Wild U.P. is concerned that wetland destruction or function loss/impairment due to destruction, facility construction, surface water re-routing, and groundwater drawdown will significantly damage or destroy a majority of the wetlands on and adjacent to Aquila’s mine site. “Wetlands within the area of influence of the modelled cone of depression can be seen on Figure 3-12.” (EIA Volume II, p. 27). Wetlands modeling in EIA Volume II fails to identify which “surface water dependent wetlands” are actually vernal wetlands. The primary concern appears to be drawdown estimates, not the loss of contextual landscape habitats. There are several additional concerns. Foth’s diagram 3-12 labeled “Groundwater Drawdown Modeling Prediction” shows that draw down effects are strictly limited to “Projected Groundwater Drawdown Contours Due to Pit Inflow-Mine **Year 7** (meters).” Since Life of Mine statements are already in doubt, what purpose was served in limiting the contours to show 7 years? WL-15b will be destroyed through the construction of the open pit. WL-15 appears to have been arbitrarily cut into in-pit and out-of-pit sections, with WL-14 and WL14-a being extensively dewatered throughout the project’s life. WL-B1, which extends to the northeast boundary of the pic, will be be dewatered almost immediately. By year 7, an alarming 1 meter of drawdown will impact numerous regulated wetlands at the property’s boundaries, impacting adjacent lands, and causing loss of water or hydraulic function for several additional regulated wetlands, including WL-C1, WL-41, WL-A1, WL-2b, with portions of larger wetlands extending beyond the Aquila project boundary.

And what happens in year 7? Certainly groundwater inflow to the open pit will not end in year 7, regardless of the mine’s life; according to the reclamation plan, it will take two years to fill the 750 ft. deep pit with waste rock, so groundwater drawdown impacts will continue to expand. If the mine’s life is extended, the current draw-down modeling is meaningless.

- Has Aquila applied for a federal wetlands permit to destroy wetland “WL-14b” which falls within the footprint of the Open Pit? Will they be required to apply for permits to alter or destroy any of the other regulated, delineated wetlands within the project area which would be effectively destroyed due to groundwater drawdown and function loss?
- According to Table 1, Summary of Wetland Impacts (EIA Volume IIF, p. 481), seven “non-regulated” wetlands at the project site will be “Total Loss” and major percentages of other wetlands will be lost.
- Shakey Lakes and Shakey River are within the impacted border zone for this project. What are the estimated drawdown effects on Shakey River and Shakey Lakes? The diagrams for drawdown fail to accurately depict modeling beyond the Project Boundary.
- According to the applicant, “Mitigation will be pursued for these wetland losses as described in the application and subsequent discussions with MDEQ. Aquila plans to use wetland preservation at another property in Menominee County to mitigate direct impacts to 0.9 ha of regulated wetlands in wetland areas WL-15b, WL-B1, and WL-B2 (Figure 3-24).” The property proposed for wetland mitigation is not identified. Is this the same mysterious

property they are offering to the State of Michigan as part of the Land Swap? *How can Aquila swap the property (no longer owning it) **and** then use it for mitigation?*

Monitoring Program

- Is the mine proposing to establish and fund a Community Environmental Monitoring Program (CEMP), such as the program established by Lundin at the Eagle Mine? If so how will environmental monitoring be conducted. Will Aquila Resources be allowed to demand a first review of exceedances before publication or announcement of a violation, as happened with the CEMP program implemented at Eagle Mine?
- In the case of Flambeau mine, the backfilled mine pit was *monitored* for water quality but there were no *compliance wells* in the former Flambeau pit area,⁶⁴ hence no tool for enforcing violations of Water Quality Standards post closure. How will monitoring be conducted during the post-closure period? How will water quality in this backfilled mine be enforced, given that water quality and chemical water balance in the pit is expected to take decades to normalize?
- Aquila installed monitoring wells in 2011 to establish baseline conditions- what were the environmental conditions at that time, given a period of drought in the U.P.? Due to the unusual drought period, shouldn't updated baseline data be provided?

Cut-off Wall Concerns

Planned depth of the cut-off wall ("cut-off wall will be excavated through surficial overburden soils and be 'keyed' into underlying bedrock" for a total depth of approximately 18 m, or 59 ft⁶⁵) appears inadequate. The application identifies "overtopping" risks as well as the presence of weathered and fractured rock in the pit, increasing the probability of direct hydraulic transmission between pit and the river. Infact at the Flambeau Mine, "overtopping" was a serious risk, not due to a 100-year flood event, but with an annual spring melt, "Foth claimed the new basin would be able to withstand a 100-year flood, but for three years in a row (2012, 2013 and 2014) it was not even able to withstand Rusk County's spring melt (i.e., the basin malfunctioned and had to be pumped to avoid overtopping)." ⁶⁶ Even the use of bentonite cutoff walls has not produced many ringing endorsements, in fact, "Mine design plans at the Flambeau Mine, as at the Back Forty Project, called for the development of a bentonite slurry cutoff wall between the pit and the Flambeau River to limit movement of water exiting the pit. It is possible the contaminated water is now moving around, under or through the slurry cutoff wall. An open records request of the Wisconsin DNR revealed that Flambeau Mining Company knew in 1989, before the mine was built, that the rock between the pit and the river was "fractured" and that the contaminated groundwater leaving the mine pit would "flow directly into the bed of the Flambeau River."⁶⁷

⁶⁴ Save the Wild U.P.'s conversation with Al Gedicks, Wisconsin Resources Protection Council, January 2016.

⁶⁵ EIA Volume II

DEQ-OOGM D 2015 22064 2015-11-12 Aquila Resources Mining Permit Application - Environmental Impact Assessment Volume II Contents: Environmental Impact Assessment and index to files, p. 136.

⁶⁶ PolyMet Decision: The Flambeau Factor. Laura Gauger. November 2015

https://flambeaumineexposed.files.wordpress.com/2015/12/000_linked_flambeau-mine-v-polymet-plus-appendices_final_links-added-dec-17-2015.pdf

⁶⁷ Back 40 Mining Permit Application. Draft Comments. February 9th, 2016. Al Geddicks, Wisconsin Resources Protection Council. <https://drive.google.com/file/d/0BwDqaes6rJxSUDN3OUo2ZjJJRjA/view?usp=sharing>

Geological and Seismic Concerns Need More Critical Evaluation

What are the seismic risks for the proposed mining project? Why is this area described as "aseismic" (free of earthquakes) in recent news stories?

From the application: "Upper Michigan is in an area of low seismic activity area. According to 2015 United States Geological Survey National Hazard information, the Project is located in the lowest seismic hazard region as shown on Figure 3-1. The following peak ground accelerations (PGA) were observed based on the information (USGS, 2014):

- PGA of 0.01g for a 1 in 475-year return period (10 percent [%] exceedance in 50 years)
- PGA of 0.03g for a 1 in 2,475-year return period (2% exceedance in 50 years)"⁶⁸

The first record of earthquakes in Michigan was documented in 1638. The USGS documents numerous historic and instrumentally recorded seismic events in Michigan, including Upper Michigan. Earthquakes have been recorded in Menominee Michigan: "A moderate earthquake of intensity V was felt at Menominee on March 13, 1905. A series of unusual occurrences in the Keweenaw Peninsula mining area form a significant part of the seismic history of Michigan. The first disturbance was on July 26, 1905 at about 6:20 in the evening. At Calumet there occurred what appeared to be a terrific explosion. Chimneys fell with a crash and plate glass windows were broken (intensity VII). The explosion was heard far down in a mine and the shock was felt all over the Keweenaw Peninsula area and as far away as Marquette, about 70 miles southeast across Lake Superior. Ten months later, on May 26, 1906, a similar phenomenon occurred. Train rails were twisted, and there was a notable sinking of the earth...."⁶⁹

According to "SEISMIC DISTURBANCES IN MICHIGAN" 1977 by Michigan State Geologist Michael Bricker: two Menominee-centered earthquakes (1905 and 1907) registered "V" on the Mercalli Intensity Scale, meaning *"Felt by almost everyone. Dishes and windows broken. Small objects moved or overturned. Trees shaken slightly."*⁷⁰ Additionally, six earthquakes were listed as having their epicenter in Escanaba (between 1939 and 1945). See page 2 of 5, Figure 1. "Approximate locations of Michigan earthquake epicenters."⁷¹

Well documented Upper Michigan seismic features include the Lake Superior Syncline, the Keweenaw Fault (Midcontinental Rift), and the Great Lakes Tectonic Zone. In any area with faults, the periodic "build-up and release" of strain is documented. Bricker's 1977 report on Michigan Seismic Disturbances states "though there appears to be no indication of active faults in Michigan, at relatively shallow depths and that extend to the surface, information on the **seismicity of a local or regional area is pertinent in the selection of building sites and the proper design and construction of such installations as nuclear power plants, nuclear waste disposal and storage facilities, dams and many other types of installations.**"

⁶⁸ MPA Volume IE, pg 12, section 3.2

⁶⁹ <http://detroit.about.com/od/neighborhoods/a/History-Of-Earthquakes-Felt-In-Detroit-And-Michigan.htm>

⁷⁰ http://www.michigan.gov/documents/deq/GIMDL-CR14_216127_7.PDF

⁷¹ http://www.michigan.gov/documents/deq/GIMDL-CR14_216127_7.PDF

According to the Michigan Geological Survey, earthquakes have been instrumentally recorded registering as high as 4.6 (1947, August 10 02:46 UTC, Kalamazoo). In the past few years, additional earthquakes have been recorded with epicenters in the same area, roughly 240 miles due SE of the proposed mine site. Obviously, scientific understanding of Michigan's underlying seismic history has continued to evolve since Bricker's report, and new subsurface fault structures, long-buried under sedimentary rock and glacial deposits, are still being "discovered."

Data recorded by Michigan's recent earthquake events in this area has "exposed a geological fault line in southwest Kalamazoo County only speculated about previously." The frequency of earthquakes is also increasing in some areas, likely due to fracking injection. According to a 2015 article in the Detroit Free Press, interviewing Harley Benz, a USGS seismologist, "While industrial activities can't be ruled out as a cause of Michigan's recent earthquakes, Benz said, "these (recent Michigan) quakes look tectonic," or related to the natural processes of the Earth's crust. The culprit could even be glacial rebound – land masses pressed down by millions of tons of ice during Michigan's last glacial period about 12,000 years ago beginning to rise, Benz said."⁷²

Buried Faults, Isostatic Rebound, Geological Pop-Ups

"We have no way of telling" – Dr. Wayne Pennington, Michigan Tech Dean of Engineering

Locally, the "Menominee Crack" is also considered to be the result of a small earthquake. "In 2010, a massive split in the ground mysteriously opened just north of Menominee." While some dismissed any seismic connection, the issue appears confirmed. "The split, which measures almost 360 feet long and 30 feet wide at its largest point, formed in Oct. 2010 following a magnitude-1 earthquake. Aside from uprooting some trees and causing others to tilt, the crack poses no threat, according to a news release. Pop-ups generally occur in places where the earth rebounds upward after being relieved of an overbearing weight from a removed quarry or a melted glacier. However, the Michigan pop-up appears to be "one-of-a-kind." "We wanted to look into the crack because we could not find information in the literature on pop-up structures forming outside specific areas," Wayne Pennington, study leader from Michigan Tech, said in the university's release. "As far as we can tell, this is a one-of-a-kind event; but in case it is not, we wanted the information about it to be available for other investigators." Although pop-ups generally occur when a great deal of pressure is relieved, they can happen spontaneously. Researchers also suspect the removal of a large tree from the area might have something to do with it.⁷³

Regulators need to ask Aquila's engineering team: what would be the effect of a spontaneous "30 foot wide crack" opening in the rock,⁷⁴ if it were to occur at the Back Forty mine site? Flooding of the mine workings or contamination of the Menominee River is real risk, and seismic activity (including unpredictable 'geological pop-up' events) must be seriously considered, not dismissed.

⁷²

<http://www.freep.com/story/news/local/michigan/2015/06/30/earthquake-battle-creek-union-city-seismic/29531229/>

⁷³

<http://www.natureworldnews.com/articles/19861/20160211/menominee-crack-michigan-researchers-finally-identify-mysterious-pop-up-feature.htm>

⁷⁴ <http://fox11online.com/news/local/northwoods/crack-in-earth-is-geological-pop-up>

"When I got there I was completely shocked by what I saw," said Wayne Pennington, Michigan Tech Dean of Engineering. Pennington says **it was no typical earthquake.** **The crack is remarkable,** but the ridge, a six-foot-high ridge, the length of a football field. That doesn't happen easily inside the earth," he said. Pennington says underground pressure on the limestone rock in the area was released, allowing the crack to form. The scientific term is a geological pop-up. "Usually it's caused by the removal of a glacier. But the glacier left here 11,000 years ago. So why did it wait until 2010 to happen?" asked Pennington.⁷⁵

Since it was first described, the Menominee "Crack" has been deemed an earthquake. "Pennington said that small earthquakes can occur almost anywhere, as stress accumulates locally and is occasionally released suddenly. "The area this event occurred is not very likely to have another event soon, but the **neighboring areas—at the ends of the ridge and crack—may experience similar events in the future,**" he said. "When? Anytime in the next couple of centuries—next week or 200 years from now; we have no way of telling."⁷⁶

Groundwater and Water Quality Concerns

- Contact water basins at the site are designed "to meet a 100 year flooding event." See our earlier comments requesting that 200 year flood event data be used throughout the planning of this facility, given the critical location on the Menominee River, and the extreme risks.
- Application states "Contaminated areas around Waste Water Treatment Plant (WWTP) will total 65,088 square meters." What is the reason, source of contamination or explanation for this expected "contamination" around the WWTP? What will be the environmental impacts?
- Groundwater elevations, water sampling and other EIA data collection took place during drought years, from 2007-2010. Is the data **accurate** or are they underestimating water levels both at the surface, flow volumes, and in groundwater. Were wetlands and vernal ponds accurately mapped, since vernal pools are ephemeral? Drought mapping info from NOAA confirms that this part of the U.P. remained in drought through the EIA preparation years.
- The Aquila site has a shallow surficial aquifer in glacial till and river sediments; these are most susceptible to elevation changes due to drought.
- How deep is the brine layer in this site? Will the pit receive waters from brine aquifers? Will the Water Treatment Plant (WTP) planned for this project include reverse osmosis (deionization)? If R/O is not used at the Back Forty, how will uranium, salts, and other heavy metals of concern be removed from the wastewater stream?
- If Aquila's Water Treatment Plant will produce filter cake waste, where will this waste product – containing sulfo-salts, toxic heavy metals and radioactive materials including uranium – be disposed? Is on-site disposal considered? Will the WTP waste product be considered "toxic waste."
- "As determined by the completed geochemical test work, the majority of waste rock is considered to be potentially reactive." Leachate testing for acid production found that "77% of all waste rock will be acid generating." At Eagle Mine, only 3 of 7 ore samples were capable of generating acid. At Back Forty, nearly all of the 11 defined lithologies are acid generating.
- Given the extremely high total sulfide concentrations for the Back Forty ore, proximity of the open pit mine to the Menominee River, presence of regulated wetlands and vernal pools

⁷⁵ http://geo.msu.edu/extra/geogmich/michigan/Maps_Graphics%5cSeismicity_Map.pdf

⁷⁶ <http://bit.ly/MTU-earthquake>

within the project boundaries, and the massive total size and depth of the planned open pit, Aquila's site should be considered *more risky than any comparable polymetal sulfide mine project*, and permitting should be more conservative and protective. PolyMet states "their ore's sulfur concentration averages around 0.6 percent. Compare that to a 30 percent sulfur concentration at the 1990s Flambeau mine in Wisconsin."

- Is the uranium present in aquilla's lithologies at a *recoverable amount*? What is a "recoverable amount?"
- Citizen question: Shallow well water in the area 30' deep. If there are contaminated or draw-down issues with private wells, who will be held responsible?

River Corridors: How Rare, How Expendable?

Comments prepared by Jon Saari, Save the Wild U.P. vice president

The baseline documentation (provided in EIA Volume IIG) examines the fish, birds, plants, and animals that inhabit the narrower project area (2 square miles) and the larger study area (about 40 square miles) around the proposed Aquila mine. Two traits stand out: it is mostly public land, and the land is dominated by the Menominee River system.

The land was not always public, but became public after the Great Cutover of the U.P. when the federal and state forests were created out of the abandoned lands that nobody wanted. They have been restored to health and now support a representative population of native plants, animals, birds, and fish. By the standards of diversity, abundance, and richness the lands are far from recovered for these wild plants and creatures, but environmental regulations and the stewardship of public agencies have assisted their recovery.

The private developments, on the other hand, have complicated their existence. Dams and weirs affect fish mobility. Residential homes and camps along watercourses change the riparian zone between water and land. Roads divide habitats. Logging has altered the forest landscape. But this corner of the U.P. is not yet fully domesticated by agriculture, settlement, and forest conversion. The public wild portion holds domestication in check, but it is illusory to think that a 16-year open pit mining operation will not tip this scale permanently away from wildlife and wild lands.

A large mining operation in a river corridor is not a compatible use. The area along a river, in one apt formulation, is composed of three-dimensional zones of "interaction that include terrestrial and aquatic ecosystems that extend down into the groundwater, up above the canopy, outward across the floodplain, up the near-slopes that drain to the water, laterally into the terrestrial ecosystem, and along the watercourse at a variable width."⁷⁷ On the Menominee River, this is the domain of the Sturgeon in the lower river corridor, the domain of the Wood Turtle who forages on the nearby uplands, the domain of many bird species that fish and live within the corridor, the domain of plant species that sense the presence of nearby flowing water.

⁷⁷ Ilhardt, Verry, and Palak, 2000, cited in the Whitewater Associates report, p. 11, p. 3503 (EIA Volume IIG)

Ninety percent of animals spent some part of their life cycle within these biologically rich riparian zones. An open pit mine with a wall tens of meters away from the 100-year floodplain of the river puts all this intricately balanced life at risk. And this threat is taking place on mostly public lands that are supposed to be the core protected area for wild lands and wildlife. We seem, as a society, to be ever ready to relinquish this public stewardship of the wild for the sake of private gains for a few, and contribute through ill-considered industrial-scale projects to an ongoing degrading of the landscape. **Is reducing and mitigating damage the best that we can do?**

The Menominee river system is a wondrous resource. **It is the largest watershed in the U.P., stretching via the Michigamme River, Lake Michigamme, and the Peshekee River to within 12 miles of Lake Superior. The watershed holds thousands of square miles within its embrace.** And yet it has little protection. Only the tributary Paint River within the Ottawa National Forest qualified for Wild and Scenic River designation, with a quarter mile “no-logging” buffer zone. **Menominee County and its townships have no set-backs or buffer zone requirements within the Menominee River riparian zone.** The many dams and impoundments have turned the Michigamme and Menominee rivers into a warmwater fishery. This weak protection status bodes ill for public state agencies doing the right thing as they contemplate a major industrial mining intrusion in the riparian management zone of the Menominee River.

These questions seem warranted:

1. A land swap with Aquila seems the ultimate abdication of public trust for these sensitive riparian lands, allowing the company to do what it will with its open pit and underground mining plans. What options are there short of a land swap? Even with a land swap, can the swap be made contingent upon a strict riparian management zone (RMZ) still under MDEQ control? Can such an RMZ guarantee that the ecologically rich area along the river will not lead to degradation of these conservation values for wild land and wildlife?
2. If a mining operation next to the Menominee River can only lead to another area sacrificed to industrial projects, another wound in already wounded landscape, when does this end? All the time and money that goes into research and documentation, for example, for threatened and endangered species, or for special natural areas like the Shakey Lakes oak savanna-pine barrens, seems for naught when industrial development trumps all.
3. When do the 1,000 cuts add up to “enough is enough”? It is not adequate to cite the statutes endlessly; they can be interpreted to justify different outcomes, including the courageous one of standing on the side of wild land and wildlife.

Menominee Riparian Corridor

“Rivers are the natural highways of all nations, not only leveling the ground and removing obstacles from the path of the traveler... but conducting him through the most interesting scenery, the most populous portions of the globe, and where the animal and vegetable kingdoms attain their greatest perfection.” – Henry David Thoreau

Wildlife Corridor - Large Mammals and Endangered Predators

No riparian wildlife corridor has been proposed to accommodate the passage of large mammals through/around the site, including rarer large mammals such as lynx, bobcat, wolves, etc. The proposed siting of the Aquila Back Forty project will effectively block the movement of wildlife along the Menominee River, a key natural riparian wildlife corridor. Proposed industrialization of this previously undeveloped site will destroy riparian habitat, forest land, T/E species, forested wetlands, and critical vernal pools. The proposal will bring catastrophic and long-lasting disruptions to the area, caused by massive earthworks, facility construction, noise and light pollution, air and water degradations, piping, berming, ditching and road building, and the fencing of hundreds of acres, resulting in destruction and fragmentation of currently-intact riparian habitat.

A collaborative study involving Wisconsin DNR, Michigan DNR and USFWS staff should be conducted to evaluate this section of the Menominee River as a **Riparian Wildlife Corridor**.⁷⁸ Study should evaluate the corridor's existing value in terms of ecological conservation, migratory use, flood control, groundwater recharge, recreation, tourism, and wildlife passage. **Evaluation is especially important given the very high ecological and cultural value of adjacent lands, and the presence of T/E species.** The Menominee River has been targeted for conservation by the Wisconsin DNR, and upstream sections of the riparian corridor are being designated as Natural Areas, following the "Menominee River Natural Resources Area Master Plan." Lands along the Menominee River are also listed as a Legacy Resource with a *priority for acquisition* in the "Wisconsin Land Legacy Report."⁷⁹ This stretch of the Menominee is further identified as part of the "Northeast Sands Ecological Landscape of Wisconsin"⁸⁰ and "offers one of the state's best opportunities to manage a large mosaic of oak-pine barrens and bracken grasslands." Critically, **"several rare species are known to occur in the (Menominee) river corridor, particularly along north-facing talus slopes, and it is likely that more rare plants and invertebrates exist than have been documented to date.** Although less than ten miles of the shoreline on the Wisconsin side of the Menominee River is in public ownership, electric power and forest products companies own a significant amount of land, much of which is currently open for public recreational use."

The permit application and EIA are inadequate in their evaluation of the riparian corridor's importance to rare and endangered species. The cougar is not mentioned in the EIA, for example. In Michigan, the cougar is listed as endangered and is protected under Michigan state law⁸¹; it is also state-protected in Wisconsin. The cougar is a native predator to this area, and long considered extirpated. Cougars and other large predators (including wolves, bobcats and lynx) are now known to utilize riparian corridors as they hunt, and riparian corridors are considered key factors in cougar dispersal, and riparian corridor vegetation is the cougar's ideal hunting habitat. According to Kevin Swanson, a Marquette-based DNR wildlife biologist "(as of 2015) Marquette County has had the most confirmed (cougar) reports with six. **Menominee County has four....**"⁸² The most recent DNR-confirmed cougars sightings on the Wisconsin side have been very close to the project site:

⁷⁸ https://www.oakgov.com/advantageoakland/media-center/Documents/gi_PlanningForGreenRiverCorridors.pdf

⁷⁹ <http://dnr.wi.gov/topic/lands/landlegacy/>

⁸⁰ <http://dnr.wi.gov/files/PDF/pubs/lf/LF0040nesands.pdf>

⁸¹ http://www.michigan.gov/dnr/0,4570,7-153-10370_12145_43573-153232--,00.html

⁸² http://www.mlive.com/news/grand-rapids/index.ssf/2015/10/dnr_confirms_31_cougar_sightin.html

September 2014, at Middle Inlet Wisconsin,⁸³ only 12 miles from the proposed Back Forty mine site⁸⁴ and another confirmed cougar sighting even closer to the Back Forty site was recorded in July 2015.⁸⁵ There have been at least four DNR-confirmed cougar sightings along the Menominee River Corridor on the Wisconsin side, according to the Wisconsin DNR.⁸⁶

The Menominee River must be viewed at the broader landscape scale, a living river corridor, part of the Northern Lake Michigan Coastal Ecological Landscape.⁸⁷ “Riparian areas provide critical wildlife habitat. Because of their location in the transition zone between aquatic and terrestrial ecosystems, riparian areas provide access to food, water, and shelter creating diverse habitat types. This diversity in turn supports a great number of unique species found nowhere else in the landscape. Because riparian areas form corridors in the landscape, they serve as pathways for species movement. Even when the surrounding landscape does not provide adequate habitat for many species, migratory birds, mammals, and fish use rivers and associated riparian habitat to travel upstream and downstream to patches of better habitat. Thus, riparian corridors provide a key component of the green infrastructure of a landscape, maintaining ecological integrity by providing connections between patches of higher quality habitat in fragmented landscapes.”⁸⁸ The Menominee riverway, combined with high-quality forest lands, serves as an important travel corridor for migrating birds, spawning fish, threatened bats, top predators, and large mammals. The riverway provides habitat for uncommon birds and rare plants. Greatest conservation of the Menominee riparian corridor is recommended given the *width, channel type and relative contiguity* of the surrounding landscape.

Cumulative environmental impacts of legacy mine pollution and hydroelectric dam impoundments were not adequately evaluated with regards to Aquila’s anticipated impacts to the river, and the river’s resiliency. **“This river corridor is largely undeveloped,** being managed for a variety of quiet recreation uses (including river running and sportfish angling), active forest management, and limited areas of old-growth forest. Also, plans have been developed to construct fish lifts to pass sturgeon to the river upstream of the two lower dams, resulting in access to more than 20 miles of suitable spawning and rearing habitat (GLRI 2010). Based on water quality and substrate characteristics alone, the Menominee River should hold more sensitive species, a greater diversity of species overall, and larger populations of some species. However, it is likely that the impacts of ten upstream dams that are managed as hydropower peaking plants create suboptimal habitat conditions for the many mussel and other species that are not adapted to the variations in stream flow or water temperature created by these dams. **Biologists also suspect that, historically, the operation of mines on tributaries of the Menominee River in Michigan may have negatively impacted water quality by creating acidic conditions that eliminated populations of species that are intolerant of low pH environments** (B. Smith, Wisconsin DNR, personal communication).”⁸⁹

⁸³ <http://bit.ly/WIcougars>

⁸⁴ <http://dnr.wi.gov/news/weekly/article/?id=3121>

⁸⁵ <http://dnr.wi.gov/news/releases/article/?id=3684>

⁸⁶ <http://dnr.wi.gov/topic/WildlifeHabitat/documents/CougarMap.pdf>

⁸⁷ <http://dnr.wi.gov/topic/landscapes/documents/1805Ch15.pdf>

⁸⁸ https://www.oakgov.com/advantageoakland/media-center/Documents/gi_PlanningForGreenRiverCorridors.pdf

⁸⁹ <http://dnr.wi.gov/topic/landscapes/documents/1805Ch15.pdf>

Menominee Riparian Corridor and the Northern Long-Eared Bat

U.S. Fish and Wildlife Service (USFWS) recently listed the northern long-eared bat (NLEB) as a threatened species under the Endangered Species Act. According to the USFWS Michigan Endangered Species by County List,⁹⁰ **NLEB has been found in and listed for Menominee County.**⁹¹ **According to the NLEBRangeCountyListO43015.xls list, the NLEB species is listed for Menominee County in Michigan,** with hibernacula sites found upriver in the Menominee Iron Range and elsewhere, but with no identified maternity/roosting trees in the U.P. (hibernacula data on a January 2016 map from Michigan DNR), pointing to an overall lack of knowledge about critical NLEB habitat.⁹² MDNR admits that “records of these locations in Michigan are limited, and we expect northern long-eared bat roosts to be present in many locations (....)” According to Dr. Kurta of Eastern Michigan University, *“nobody find the NLEB, because nobody looks for them.”*

A Northern Long Eared Bat survey should be required for the Aquila property. Before the radical industrialization of this forest and riparian area, the applicant should be required to conduct a survey of the property looking for Northern Long Eared Bat (NLEB) maternity/roosting sites near their proposed project, especially given the recent listing of NLEB, and known presence of NLEB hibernacula upriver. An NLEB-specific bat survey should be conducted, using acoustical and mist net surveys throughout the Aquila Back Forty site.

The survey should encompass all State-owned Escanaba State Forest parcels in the proposed Land Swap. The burden of proof is on the land-owner, both Aquila and the State of Michigan, to determine the presence of NLEB maternity trees; the “expectation is that a project proponent will complete due diligence.”⁹³ Currently, not enough is understood about forest-dwelling bats and their movement along the Menominee River riparian corridor. Under the Endangered Species Act, “taking the habitat is the same as taking (killing) the bat.”

Applicant Fails To Address Existing Impairments⁹⁴ of the Menominee River

Despite decades of biological and environmental recovery, stretches of the river and it’s surrounding ecological landscape have been designated as **303(d) impaired waters in Michigan**. Impaired waters include a long reach of the Menominee River which passes the Aquila site, stretching from Pier’s Gorge to Lower Scott Flowage (Lake Michigan): “Fish Consumption Advisory for Mercury, TMDL needed; Fish Consumption Advisory for Polychlorinated Biphenyls (PCBs), TMDL needed.”⁹⁵ Within the Northern Lake Michigan Coastal Ecological Landscape, the lower reaches of the Menominee River has been listed as an Area of Concern (AOC), identified by the Great Lakes Water Quality Agreement between the U.S. and Canadian governments. In the lower Menominee AOC, “Six of 14 beneficial use impairments have been identified through the Remedial Action Plan (RAP) process. A primary cause of the identified use impairments is **arsenic contamination** in the turning basin and in sediments...” Beneficial use impairments include fish consumption advisories, low oxygen, and excessive

⁹⁰ “NLEBRangeCountyListO43015.xls

⁹¹ <http://www.fws.gov/midwest/endangered/lists/michigan-cty.html>

⁹² <http://bit.ly/NLEB-roost>

⁹³ <http://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEB.html>

⁹⁴ <http://dnr.wi.gov/topic/landscapes/documents/1805Ch15.pdf>

⁹⁵ <http://bit.ly/Menominee-Impairment>

sedimentation are the major water use impairments found in these waters, including impacts to human health, aesthetics, and biodiversity.

While the lower Menominee AOC is downstream, special concern and protective limits should be required for arsenic at this site, given arsenic's ongoing legacy contamination of Menominee River sediments from industry. **In fact, arsenic emissions exceeding air quality standards is already modeled to be a problem in Aquila's draft Air Quality Permit.** Arsenic can be released to the biosphere through waste tailings, slurry water, roasting of gold-containing ore to remove sulfur and sulfur oxides and bacterially enhanced leaching.⁹⁶

Special concerns for arsenic should include consider the following factors:

"when assessing the impacts of arsenic on aquatic ecosystems: a. Little work has been done on the long-term effects of arsenic on organisms at chronic concentrations (blocking or depressing enzyme systems, pathological changes in tissues and limiting development of growth, reproduction, metabolism and other physiologic processes). b. Additional long-term studies and studies involving sensitive life stages such as embryos, larvae, or early juveniles are needed to more accurately assess the toxicity of arsenic forms to fish and other aquatic organisms. c. While there is not enough data to allow derivation of numerical criteria for aquatic organisms for pentavalent arsenic (As (V)) or any organic arsenic compound, indications are that some organisms are more sensitive or at least as sensitive to As (V) and organic arsenic as they are to exposure to As (ID) for which water quality criteria have been developed. d. Exposure to low levels of arsenic by organisms at certain trophic levels may have significant ecosystem implications. For example, Eisler (1988) indicates that **chronic studies with mass cultures of natural phytoplankton communities exposed to low levels of arsenate (As (V)) of 1.0 to 15 pg/l showed that As (V) differentially inhibits certain plants, causing a marked change in species composition, succession and predator-prey relations.** The significance of these changes on carbon transfer between trophic levels is unknown."⁹⁷

While arsenic does not appear to biomagnify up the food chain, it does bioaccumulate in exposed fish and aquatic life. Testing by the WDNR in 1989 (surface water above contaminated sediments) and in 1991 (contaminated sediments) indicated toxicity to exposed aquatic test organisms. The toxicity test used for these analyses is the same test procedure that wastewater dischargers are required to pass. Chemical analyses of the river water (in the Menominee AOC) detected arsenic concentrations of 3,900 ug/l and 18,000 ug/l in the Turning Basin and Eighth Street slip, respectively. Analyses also revealed arsenic concentrations of 26 ug/l in the water column over sediment in Menedaunee Harbor, located one mile downstream from Ansul. Referring to these test results, Masnado (WDNR, 1990) noted the following: "The observed lethality at the Turning Basin and Eighth Street Slip is alarming. This is especially important with regards to the very immediate response exhibited by both *Ceriodaphnia dubia* and *Daphnia muma* If these were effluent samples ... whole effluent toxicity limitations would be imposed in their respective permits."⁹⁸

Application's EIA includes no evaluation of the landscapes current value in terms of the river's ecological services, forestry value, riparian corridor etc. No mitigation plan has been proposed for

⁹⁶ <http://www.ncbi.nlm.nih.gov/pubmed/14561078>

⁹⁷ <http://www.epa.gov/menominee-river-aoc>

⁹⁸ <http://www.epa.gov/menominee-river-aoc>

sensitive species that will be affected by the industrialization of this currently "rural and undeveloped" forested riparian corridor. **A species-specific evaluation of the Menominee Riparian Corridor should be required.**

Application fails to address climate Change and Ecosystems Services. According to a Michigan Wildlife Action Plan workshop, held to address the threat of climate change to Michigan's wildlife, "Until specific impacts and responses are better known, the best adaptation strategies are those that reduce the impacts of other stressors and also provide benefits to human societies (i.e., ecosystems services)." ⁹⁹

Shared Oversight Requested: Interstate and Federal Agencies

Wisconsin DNR Involvement Requested

The "boundary buffer" of the Back Forty project crosses the Menominee River; NPDES discharges will impact interstate waters. What guidance or input has the Wisconsin DNR provided, regarding this mine application?

USACE Involvement Requested

The "boundary buffer" of the Back Forty project crosses the Menominee River. Has the United States Army Corps of Engineers provided guidance regarding this project? The NPDES permit will enable direct wastewater discharges to this waterway, for example, and directly degrade or require displacement of protected native mussels found in the Menominee River. Since USACE regulates projects that "impact navigable waterways, **USACE should be represented on the DEQ's permit application review team.** The boundary buffer of the Back Forty project includes interstate, navigable waterways. USACE may also offer guidance and answer questions related to the presence of two large hydroelectric dams just upstream from the proposed mine site.

USFWS Involvement Requested

United States Fish and Wildlife Service (USFWS) is responsible for threatened and endangered species that stand to be destroyed or suffer habitat degradations due to this proposed mine. The Menominee River is an interstate boundary, and a USFWS-managed fishery system. Has federal guidance been sought regarding the proposed "relocation" of T/E freshwater mussels? **USFWS should be represented on the DEQ's permit application review team.**

⁹⁹ <https://www.nwf.org/pdf/SWAP/MIWorkshopSummary.pdf>

Public Responsiveness and Regulatory Capture

As Michigan residents and taxpayers, Save the Wild U.P. resents the fact that the “mining” page of DEQ's website (http://www.michigan.gov/deq/0,4561,7-135-3311_18442-309491--,00.html) is highly biased in favor of any sort of mining, anywhere in Michigan. Even worse, the links provided for more information on each project lead directly the corporate websites of the mining companies. If there was any doubt that the MDEQ is a poster child for “regulatory capture” by the industries it is supposed to be regulating, the MDEQ's mining “information” page dispels it.

In December and January, numerous members of the public, including SWUP board members and Menominee Nation tribal representatives reported problems accessing the mine permit application (a set of PDF files) provided by the MDEQ. This problem was not resolved until mid-January.

Concerned citizens entering the search string “DEQ +Aquila Back Forty” during this permit review process would find (as the top link returned) a very outdated PDF file announcing that “Aquila Resources Inc. in a joint venture with HudBay Minerals (....) The new mine **will**¹⁰⁰ be located in Lake Township...”¹⁰¹

Public Accessibility of the Mining Permit Application

Starting on December 23, 2015, Save the Wild U.P. made several written and verbal requests, asking the MDEQ to provide a key PDF file (Mining Permit Application Volume I) in a useable, accessible format. These requests were not resolved, even after it was explained to the MDEQ that the copy-protected PDF file was not ADA compliant.

February 4th, 2016, Save the Wild U.P. wrote:

Mr. Maki, Mr. Casey and Ms. Feldpausch,

I am following up about an email (sent Dec. 23, 2015) reporting problems with the text of "*DEQ-OOGM D 2015 22054 2015-11-12 Aquila Resources Mining Permit Application - Volume I.pdf*." On behalf of Save the Wild U.P., Kathleen Heideman alerted DEQ that this permit file was copy-protected, causing usability problems. She explained that those reading the permit were unable to "cut-&-paste" text while taking notes, an impediment to the public review process, and requested a corrected PDF.

During the most recent Environmental Stakeholders meeting, Mr. Maki said he didn't understand why this was needed or why it was important. He also said that members of the public could stop by the DEQ office to see their printed version of the permit.

I'm afraid the problem is actually more serious. Since the text is copy-protected, the PDF document fails to meet Michigan's public accessibility standards.

<http://www.michigan.gov/deq/0,4561,7-135--281460--,00.html>

¹⁰⁰ Note: use of “will” expresses a person's attitude toward the factuality or likelihood that a situation is true.... inferred from known details. “Will” expresses that the speaker is certain. By contrast, “may, might, and could” express uncertain opinion, based on very little information.

¹⁰¹ http://www.michigan.gov/documents/deq/Aquila_Back40_437228_7.pdf

http://www.michigan.gov/documents/som/Look_and_Feel_Standards_302051_7.pdf

Files disseminated by the State of Michigan and DEQ should be compliant with the Americans with Disabilities Act. If you scan this PDF with an accessibility checker, as the State's guidance recommends, you'll find many problems prevent this document from being considered accessible: text is not tagged; images have no alternate text; text blocks have no language specified; but most critically, the text in the entire first half of the document contain characters with "no reliable mapping to unicode."

This last error prohibits users from copying & pasting any text, using text-to-speech assistive tools, etc. Under federal guidelines, unicode errors are considered a "required fix for PDF files."

I remain hopeful that the DEQ will seriously consider our request for a usable, accessible PDF copy of this key permit file. Thank you!

Best,
Alexandra Maxwell

On February 8th, 2016 Save the Wild U.P. received the following response:

Hi Alexandra,

It is my understanding that you have some concerns with the usability associated with the Adobe formatting of the Aquila Resources Mining Permit Application. In addition to having the application in its entirety available at the township hall, **our aim with posting it online was to provide ease for public viewing.** I apologize for your frustration. However, the Adobe format application file was received as an original electronic document from the applicant, **and it is not accepted policy or practice for us to modify an original document.** Also, it is my understanding that depending on the Adobe version being used by the public, some usability options may not be available. I was able to select data on the files that I tested after seeing your concerns. A few suggestions would be for you to 'enable editing' in Adobe, and/or convert each section of the application into a Microsoft Word document for your use.

As you may know, the application was originally uploaded to our FTP site for public use, and based upon a few comments of difficulty with accessing this site, we were able to waive other internal policies and procedures to provide a direct link to the file for further ease of public use and access.

Please let me know if you have any questions.

Thank you,
Joseph J. Victory, Geologist, Permits and Bonding Unit

Save the Wild U.P.'s position remains that the State of Michigan failed to provide the primary permit file in an accessible format, an impediment to public participation. As we explained to MDEQ in an email on December 23rd, 2015, we believe *the file's problem ultimately lies with the applicant*. If it is against DEQ protocol to "modify" an original file, the MDEQ should require that the applicant provide a corrected, ADA-compliant file. The MDEQ would take this common-sense action if the file was corrupted or could not be opened.

Save the Wild U.P. never received responses to any of the following inquiries:

January 6, 2016
Hello Mr. Maki and Mr. Casey,

Could you please share contact information for the individuals or departments at the DNR responsible for reviewing the land swap associated with the Aquila Resources project?

Thank you,
Alexandra Maxwell

January 6, 2016

Hi Mr. Casey,
Reaching out to see when the NPDES permit for the Aquila Resources project will be public noticed and enter the public comment period?

Thank you!
Alexandra Maxwell

January 6, 2016

Hello Mr. Maki and Mr. Casey,
Last question! Will the State Archaeology staff be available at any upcoming public meetings to discuss the review of the cultural resource sites contained within the footprint of the proposed Aquila Project? We have lots of questions to ask them!

Thank you for your time,
Alexandra Maxwell

January 7, 2016

Hello Steve and Joe,
Could we please have access to digital copies of two current lease agreements between Aquila and the State of Michigan, as referenced on a map in the Back Forty mine permit application. I believe these are: Lease # M-00776 and Lease # M-00772. If this information is with the DNR could we please have contact information for the responsible person or department? Thanks so much for your time.
Alexandra Maxwell

Conclusion

Save the Wild U.P. strongly opposes permitting of the Aquila Resources Back Forty sulfide mine. Aquila Resources' Mining Permit Application and Environmental Impact Assessment include misleading and even fraudulent information, and are inadequate and unacceptable under federal and state standards.

Save the Wild U.P. objects to Aquila's proposed "Land Swap" – swapping unassessed private lands, not currently owned by Aquila Resources, in exchange for Escanaba State Forest land – an exchange which underpins the entire Aquila Back Forty proposal. The proposed land exchange threatens rare savanna habitat, and a number of threatened and endangered species. The mining proposal's open pit mine, contingent upon the Land Swap, would disturb or destroy irreplaceable archaeological resources, Menominee River fisheries, and more.

Save the Wild U.P. opposes the issuance of any federal or *federally-delegated* permit that would enable Aquila's Back Forty project to destroy wetlands, impair water quality, lower air quality, or constitute a "taking" of any endangered species or the species' habitat.

Save the Wild U.P. believes that Aquila's Back Forty mining permit application and EIA is inadequate under federal and state laws and regulations—

- It proposes using the Flambeau Mine as an example of non-polluting mine, and a model for post-closure remediation.
- It fails to evaluate pollution risks to drinking water, fisheries (including endangered mussels) and human health using realistic assumptions about how much polluted seepage will be captured and treated during operations, reclamation, and closure.
- It fails to analyze health risks and impacts on communities who rely on fishing for subsistence, including risks from toxic heavy metals, arsenic, methylmercury, use of cyanidation, and acid mine drainage.
- It fails to adequately consider alternatives to minimize environmental harm and reduce polluted seepage from permanent waste facilities.

Save the Wild U.P. strongly objects to the proposed Aquila Back Forty mining permit application—

- The mine proposal conflicts with federal policy to protect wetlands.
- This mining project will result in the direct destruction of regulated and unregulated wetlands, resulting in the impairment and degradation of surface and groundwater.
- It would harm endangered, threatened and special concern species, including sturgeon, mussels, the Northern Long-eared Bat, dwarf milkweed and the Pitcher's thistle.
- It is not in the public interest, would impair tribal resources, and would result in an uncalculated loss of ecological services.
- Aquila Back Forty wetlands destruction and impairments would have adverse impacts on freshwater fisheries, aquatic life, wildlife, human health and welfare, environmental justice and special aquatic sites.

We formally request that the Michigan Department of Environmental Quality **reject** the Aquila Back Forty Mining Permit Application and EIA as misleading or inadequate, and that Michigan Department of Natural Resources reject the proposed land exchange of Escanaba State Forest lands for the Aquila Back Forty project. We further request that the U.S. Environmental Protection Agency veto and the U.S. Army Corps of Engineers deny any Section 404 permit that would allow Aquila Back Forty to degrade the Menominee River and the riparian corridor through industrial wastewater discharges and/or wetlands destruction.

We request specific responses to our comments.

Sincerely,

Kathleen Heideman, Save the Wild U.P. president, president@savethewildup.org



Alexandra Maxwell, Save the Wild U.P. executive director, grassroots@savethewildup.org

A handwritten signature in black ink, appearing to read 'Alexandra Maxwell'. The signature is fluid and cursive, with a large loop at the end. There is a small, faint circular stamp or logo to the left of the signature.

Save the Wild U.P. Board of Directors
Save the Wild U.P. Advisory Board